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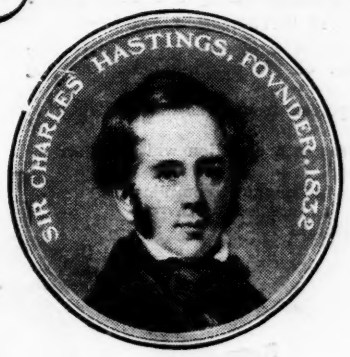

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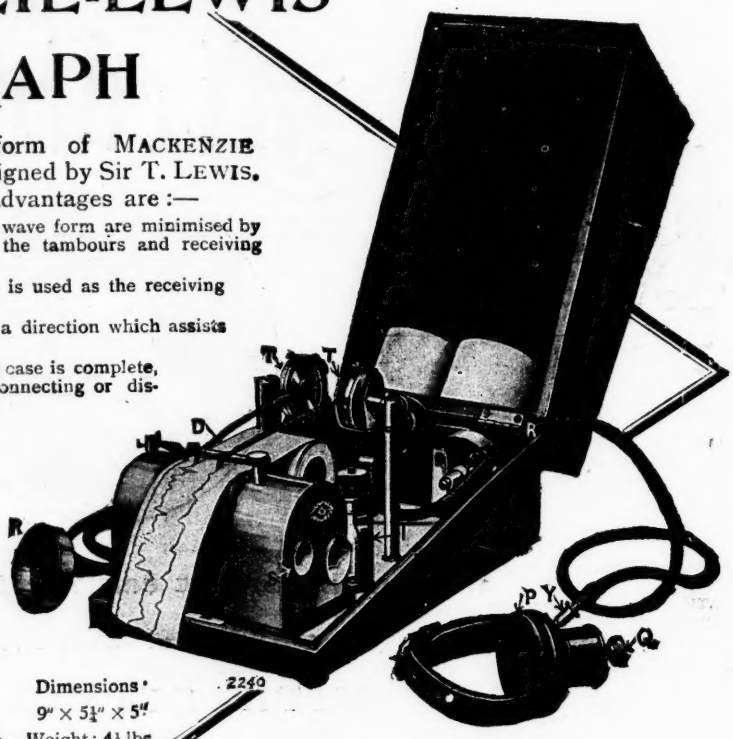

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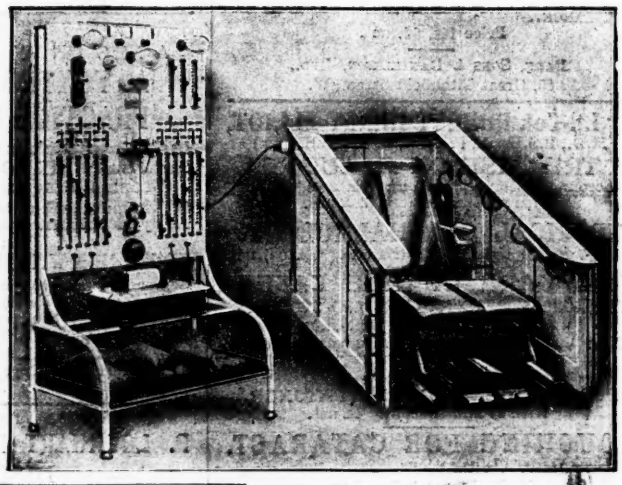

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DISCUSSION ON THE TREATMENT OF NEURO-SYPHILIS.

INTRODUCTORY PAPER
BY
SIR JAMES PURVES-STEWART, K.C.M.G., C.B.,
Senior Physician to the Westminster Hospital.

PRELIMINARY CONSIDERATIONS.

BEFORE attacking the main subject of our discussion—namely, the treatment of neuro-syphilis, it is convenient to clear the ground by a few preliminary conceptions.

First, what do we mean by neuro-syphilis? Neuro-syphilis does not mean the mere presence of nervous or mental symptoms in a syphilitic patient. It comprises only such nervous or mental symptoms as are actually due to the syphilitic organism or its toxin—a totally different affair. Let me make this clear by a few simple examples. A syphilitic patient may show signs of gross organic disease of the spinal cord or brain or meninges, or he may develop mental symptoms of various sorts. These nervous or mental symptoms are sometimes of syphilitic origin—for example, gummatous disease of the brain or spinal cord, tabes dorsalis, paralytic dementia, etc. But he may also have nervous or mental symptoms quite independently of his syphilitic infection. Diseases such as hemiplegia, epilepsy, manic-depressive insanity, and dementia praecox can occur in syphilitic and in non-syphilitic patients alike.

It has long been recognized that the nervous system and its meninges may be invaded by syphilitic lesions at quite a short interval, even within a few weeks, after the original syphilitic infection. Generations ago our medical forefathers were familiar with the headaches of so-called secondary syphilis. This clinical fact they chronicled without explaining it. We now know that such headaches are the sign of a syphilitic meningitis. The old classification of syphilitic phenomena into primary, secondary, tertiary, and post-tertiary stages has had to be modified. For example, it is now recognized that gummata, which we were once taught to regard as typically "tertiary" lesions, can occur within a few weeks after infection, during the so-called "secondary" stage. Moreover, certain degenerative diseases, like tabes and paralytic dementia, which were formerly not considered as syphilitic at all, are now universally admitted as due to the disease.

In untreated cases of syphilis, even in the absence of clinical nervous or mental phenomena, Plaut, Dreyfus,[6] and others have shown that pathological changes occur in the cerebro-spinal fluid in from 80 to 85 per cent. of all "secondary" cases, coincident with the appearance of a positive Wassermann reaction in the blood. And even in cases which have been energetically treated, from 20 to 25 per cent. have pathological changes in the cerebro-spinal fluid, indicating the presence of a syphilitic meningeal reaction. Fortunately in most cases this is a transient affair, and is not necessarily followed by permanent neuro-syphilis. The high percentage of early meningeal reactions in syphilis has led some observers to the conclusion that of late years, especially since the introduction of modern methods of treatment, neuro-syphilis is becoming more frequent. I am strongly inclined, however, to agree with Fordyce and Rosen[9] that this increase is apparent rather than real. It can be readily explained by the more accurate knowledge which we now possess of the disease, together with our more systematic examination of patients by modern methods, including especially the examination of the cerebro-spinal fluid. Syphilitic lesions in the central nervous system also occur during later stages of the disease. These are probably due to spread from infective spirochaetal foci in lymph glands, blood vessels, peripheral nerves, and so on, reaching the central organ or its meninges along perivascular, perineural, and periradicular lymphatics.

Discarding, then, the old classification of syphilitic lesions, according to the time of onset of the infection, into primary, secondary, tertiary, and post-tertiary (or meta-syphilitic), we prefer to adopt the pathological classification into meningo-vascular syphilis on the one hand and parenchymatous neuro-syphilis on the other, or combinations of these two.

Under meningo-vascular neuro-syphilis we include gummatous inflammations of vessel walls and of cerebral meninges, gummatous tumours, also syphilitic arteritis and peri-arteritis of the brain and meninges, together with the occasional development of secondary vascular occlusions. These morbid conditions may occur either singly, successively, or simultaneously, and at any phase of the disease.

By parenchymatous neuro-syphilis we mean a toxic, neuronic degeneration or decay, generally late in onset, exemplified in such maladies as tabes dorsalis, paralytic dementia, primary atrophy of the optic or auditory nerves, various other degenerative diseases of the spinal cord and other parts of the central nervous system.

Neuro-relapses.

The so-called neuro-relapses or "neuro-recidive" are curious outbursts of neuro-syphilis, partly meningo-vascular, partly parenchymatous. These are precipitated by certain forms of treatment, especially after insufficient treatment by arsenobenzol compounds. Drugs of this sort appear to produce their beneficial effects by dissolving the spirochaetes. But whilst so doing, and giving rise to a local inflammatory reaction in the immediate neighbourhood, a general effect may also be produced throughout the body owing to a sudden flooding of the circulation with the endotoxins of the slain spirochaetes. Such endotoxins may attack the brain or meninges, producing a neuro-relapse.

The mildest clinical variety of neuro-relapse consists in headache, vertigo, and tinnitus, often with insomnia, all of which symptoms are probably due to a basal meningitic reaction. A second variety comprises local cranial nerve lesions, especially of the optic and auditory nerves. Or still more severe symptoms may occur, including mental confusion, epileptic fits, dementia, and even coma.

Such neuro-relapses (all of them accompanied by well-marked changes in the cerebro-spinal fluid) occur about six weeks after the last dose of a salvarsan course. They demand renewed and energetic antisyphilitic treatment.

Diagnosis of Neuro-syphilis.

What are our diagnostic criteria for the establishment of a diagnosis of neuro-syphilis? They may be clinical and neurological on the one hand (impairment of light reaction in the pupil being perhaps the commonest physical sign), or they may be serological on the other, shown by examination of the blood and cerebro-spinal fluid. These latter comprise a positive Wassermann reaction in the blood and cerebro-spinal fluid, also pleocytosis of the cerebro-spinal fluid, with positive globulin and gold reactions. Better still, we may have a combination of clinical and serological signs. In order to exclude neuro-syphilis, not only must the clinical signs but also the cerebro-spinal fluid be proved negative.

It is important to remember that a normal condition of the cerebro-spinal fluid, by itself, does not necessarily exclude neuro-syphilis. As with any other physical sign, a negative observation is of less diagnostic value negatively than a positive result is positively, in establishing a diagnosis. Thus, for example, we may meet with normal cerebro-spinal fluid in many cases of syphilitic vascular disease of the brain, also in non-progressive cases of tabes and in other spinal cord degenerations of undoubted syphilitic origin. On the other hand, a patient who is clinically healthy and free from all symptoms of nervous or mental disease may show well-marked syphilitic changes in his cerebro-spinal fluid. Such changes may coexist with either a positive or a negative Wassermann reaction in the blood. The presence of syphilitic changes in the cerebro-spinal fluid does not always have the same significance, for whilst in most cases they indicate active syphilitic lesions of the nervous system, in other cases they may merely indicate the normal reaction of the meninges to a threatened invasion. All this shows how careful we must

be in our diagnosis before embarking upon any scheme of treatment.

Although this discussion is specially directed to neuro-syphilis and its treatment, we must never lose sight of the fact that neuro syphilis is only part of the greater subject of syphilitic infection of the body as a whole.

Preventive Treatment.

The prevention of syphilis and other venereal diseases is now the object of a great crusade by energetic rival societies. This is not the moment to open the question as to the relative merits of preventive measures locally applied before undergoing the risk of venereal infection (as advocated by one organization) *versus* early treatment, also locally applied, shortly after the risk has actually been incurred (as advised by the other society). Partisans of both parties may be present here, and it is not for us to enter on a discussion, however interesting, which would lead us too far from our own particular goal.

As to the special prevention of neuro-syphilis in patients who have already acquired a syphilitic infection, we must frankly recognize that, once a blood infection has occurred, there is no means by which we can fence off any particular system or organ of the body or prevent the infection from reaching all parts of the circulation, including that of the central nervous system. Our first and urgent duty, from the preventive standpoint, is to treat assiduously the general syphilitic blood infection until the patient becomes free from all clinical and serological signs. If such treatment proves successful, the nervous system will share in the general disinfection of the whole body.

Neurotropic Organisms or Syphilotropic Nervous Tissues?

It is interesting to inquire what are the factors which determine why some syphilitic patients develop neuro-syphilis, whilst others, apparently infected with equal severity and treated with equal assiduity, escape neuro-syphilis. And are any of these factors preventable?

The problem may be attacked from two different sides. Some observers argue the existence of a special strain of spirochaete which is "neurotropic"—that is, having a special affinity for the nervous tissues. In support of this view the occasional occurrence of conjugal neuro-syphilis is advanced. There is also Plaut's well-known example of seven glass-blowers all of whom were infected from the same source with chancre of the lip; ten years later, out of five who came under observation, four had developed either tabes or paralytic dementia. Yet, notwithstanding experimental work on animals by Levaditi and Marie and others, the evidence of a special neurotropic strain of spirochaete is at present unconvincing.

Another possibility is that we have to do with a variable individual reaction of the nervous issues in different individuals, so that in some individuals, once they have acquired the general infection, the nervous system is specially vulnerable or "syphilotropic." Whether this supposed vulnerability is inborn or acquired is again a separate problem. Many years ago Edinger propounded his exhaustion theory, according to which it is those nerve tracts that have been specially overworked which are supposed to be picked out by the syphilitic toxin and to degenerate. In support of his thesis he pointed out the relative frequency of tabes among syphilitic individuals who specially overexerted their limbs, and the frequency of paralytic dementia amongst brain workers. Edinger therefore advised every syphilitic patient carefully to avoid physical overexertion or fatigue, so as to escape tabes, and similarly to avoid mental overstrain, so as to avoid paralytic dementia. This counsel of perfection is difficult to carry out, for who can judge exactly how much in the way of physical or mental effort constitutes overexertion?

Varieties of Syphilitic Lesions in the Central Nervous System.

We have to recognize two distinct classes of lesions.

Firstly, we have meningo-vascular lesions, including gummata and syphilitic endarteritis. Gummata arise in non-nervous tissues and compress or invade the brain or spinal cord. Diffuse gummatous infiltrations may also occur in the meninges or around the blood vessels of the brain or cord. Syphilitic endarteritis frequently culminates in thrombosis of the affected artery, producing an area of infarction or softening in the brain or cord, followed by corresponding sclerosis.

Secondly, there is the group of parenchymatous nervous diseases, characterized by primary degeneration of various special nerve cells and nerve tracts. These diseases are neither the direct effects of gummatous deposits nor of arterial disease (although lesions of this sort frequently coexist), but they result from the direct action of the syphilitic toxin upon the nervous structures. Primary degenerative lesions of this sort may be followed by sclerotic overgrowth of the neuroglia in the affected tracts, independent of any meningeal or vascular lesion. This primary degenerative group includes such diseases as paralytic dementia, tabes, certain forms of primary optic atrophy, Erb's syphilitic paraplegia, and certain other forms of organic nervous disease occurring in the children of syphilitic parents.

These two varieties of syphilitic lesions differ widely in their respective prospects of response to treatment. Gummata, whether compressing or invading the nervous structures, can be brought to a standstill by medicinal remedies, and if the nervous structures have only been compressed and not actually destroyed recovery may be complete. If, however, a gumma leaves behind it a fibrous cicatrix, or if actual degeneration of nerve tracts has occurred within the central nervous system, a certain amount of permanent damage inevitably remains, even after the original syphilitic process has subsided. In the case of syphilitic arterial diseases, the lesion in the arterial wall may yield to treatment; but here also, if thrombosis has already occurred, producing an actual area of infarction, the damage to the structures within the territory of the diseased vessel is necessarily permanent. The prognosis, therefore, of syphilitic softenings is relatively bad. Secondly, with regard to the primarily degenerative diseases, such as tabes and paralytic dementia, these have hitherto tended to pursue an irregularly progressive course, generally uninfluenced, or at the most only slightly alleviated, by the most assiduous antisyphilitic treatment. Sometimes, however, these diseases, after attaining a certain degree of intensity, appear to come to a spontaneous standstill. Such arrest may last for years, although there is always a danger that the disease may subsequently light up again to renewed activity. We have also to bear in mind that in the case of degenerated nerve cells and nerve fibres it is only those which are outside the central nervous system, and which possess a neurilemma, that are capable of regeneration. Within the central nervous system itself, once degeneration of the nerve elements has occurred, it is vain to look for their regeneration. Therefore in parenchymatous neuro-syphilis the most we can hope for is to arrest the degeneration at the stage which it has already reached and to prevent the syphilitic toxin from attacking fresh neuronic systems.

In other words, meningo-vascular syphilis is far more amenable to treatment than parenchymatous neuro-syphilis, and the prognosis in any individual case depends not only on our actual methods of treatment but upon the relative proportions in which these two varieties of lesions are intermingled.

I have ventured to direct your attention to the foregoing points in the neuro-pathology of cerebro-spinal syphilis because it is essential in the treatment of the various types of the disease to have a clear idea of what exactly we are attacking and of how much improvement is anatomically possible, supposing the syphilitic infection be successfully removed. Let us now turn to the problem of practical therapeutics.

TREATMENT OF NEURO-SYPHILIS.

The modern treatment of neuro-syphilis does not imply that we should discard any of the older remedies which for so many years have been proved of value. The classical method of attacking syphilis is by means of mercury, supplemented in certain cases by the use of iodides. Excellent results have been obtained in the past, chiefly in the gummatous and meningo-vascular types of the disease, as every neurologist can testify. In recent years the introduction of the arsenobenzol group of drugs, of which the most notable examples are salvarsan and neo-salvarsan, has added powerful weapons to our therapeutic armoury. Most physicians agree that salvarsan produces its best results when combined with mercurial treatment.

Besides deciding in each particular case which drug or combination of drugs he will employ, the physician has also

to consider the channel of administration, whether by the mouth, by inunction or fumigation into the skin, or by injections—hypodermic, intramuscular, intravenous, or intrathecal. In making his decision the physician is influenced by various factors, such as the acuteness or chronicity of the symptoms, the amount of personal supervision that is attainable, the desirability from the patient's point of view of rendering the treatment as little conspicuous as possible (this is often a special drawback to mercurial inunction), and upon the perseverance or otherwise with which the patient, if left to himself, is likely to carry out a long course of treatment.

The present-day treatment, by a combination of salvarsan and mercury, as employed in ordinary syphilis, is applicable to neuro-syphilis as well, bearing in mind certain precautions. Thus, for example, in neuro-syphilis most of us consider it risky to give salvarsan in the full intravenous dose of 0.6 gram. It is safer to give repeated doses of not more than 0.3 gram. In this way not only do we diminish the chances of acute arsenical symptoms, but the series of smaller doses is less likely to be followed by the alarming group of intracranial syphilitic symptoms constituting the neuro-relapses to which we have already referred. Further, patients with renal or well-marked cardio-vascular disease are, as a rule, unsuitable for salvarsan medication. The very rapidity with which the drug acts in removing gummatous deposits may be a source of danger—for example, in the neighbourhood of diseased vessel walls.

Results of Treatment in Gummatous and Meningo-vascular Syphilis.

Gummatous lesions are those which respond best to ordinary antisyphilitic treatment. Time does not permit of detailing clinical examples, such as can be readily found in the experience of most of us. In a former paper I have already recorded a number of illustrative cases.

With regard to syphilitic arterial lesions within the nervous system, we are all in agreement that the amount of recovery depends on whether the syphilitic endarteritis is attacked in time, so that the lumen of the artery is restored before thrombosis has actually occurred, in which case complete recovery may be obtained. If, on the other hand, thrombosis has already occurred in the diseased vessel, leaving an infarct with destruction of nerve tissues, in this case no treatment can restore the necrosed area.

As regards the gummatous and meningo-vascular types of neuro-syphilis and their prospects of successful treatment by the ordinary antisyphilitic remedies, there seems little room for differences of opinion. The results will vary according to the stage at which such treatment is carried out.

Treatment of Parenchymatous Neuro-syphilis.

When we come to the parenchymatous group of neuro-syphilis the problem is altogether different. This group of maladies comprises primary degenerations varying in type according as the syphilitic toxin exercises its selective action upon one or other neuronic system. Thus in one case we have the exogenous fibres of the posterior columns picked out, producing tabes dorsalis; in another the lateral columns are mainly selected, as in Erb's syphilitic paraplegia; in a third we have primary optic atrophy; whilst in a fourth the cortical nerve cells with their intercommunicating tangential fibres are picked out, as in paralytic dementia. We also meet with mixed cases—as, for example, where tabes dorsalis is combined with optic atrophy, or where tabes is associated with paralytic dementia, constituting the well-known tabo-paralysis.

This class of diseases is singularly resistant to treatment, and for several reasons. First, as we have already seen, regeneration of destroyed nerve elements within the central nervous system (as contrasted with the peripheral nerves) does not occur. The most we can hope for, in the central nervous system, is to arrest the degeneration at the stage which it has already reached and to make the most of those nerve cells and fibres which survive. Another important reason for the resistance to treatment shown by parenchymatous neuro-syphilis is the peculiar situation of the syphilitic parasites with reference to the blood stream. The spirochaetes are situated in the nerve elements themselves. Now, the circulation within the central nervous system differs from that in other parts of the body, inasmuch as the capillary walls are not in contact with the nerve elements but are separated from them by perivascular lymph spaces. Moreover, each nerve cell has its pericellular lymph space. These lymph spaces are irrigated by the cerebro-spinal fluid, which in its turn is reabsorbed into the blood through the arachnoidal villi. Thus medicinal substances destined for the central nervous system have to gain access to the cerebro-spinal fluid before they can reach the nerve cells or the spirochaetes within them.

The cerebro-spinal fluid is secreted by the glandular cells covering the choroid plexuses within the cerebral ventricles. These secreting cells have a selective action, permitting comparatively few substances to pass from the blood stream into the cerebro-spinal fluid. Amongst them is alcohol, which, if administered by the mouth in sufficient quantities, can be detected in the cerebro-spinal fluid; or, again, urotropin taken by the mouth can be shown to yield formic aldehyde in the fluid. To other substances the choroidal ependyma is impervious, notably to mercurial and arsenical salts, which at the present time are our most important spirochaeticidal drugs. Thus, no matter how assiduously the general circulation be drenched with mercury or salvarsan, the choroid plexuses do not transmit these drugs into the cerebro-spinal fluid nor allow them to reach the nerve elements. And so, whilst gummata may be removed from the meninges and interstitial tissues by remedies circulating in the blood stream, and although syphilitic endarteritis may clear up, those nerve cells and nerve fibres which are being destroyed directly by the syphilitic organism and its toxin, entrenched behind the pericellular and perivascular lymph spaces, continue to decay.

Whatever be the true explanation, it is commonly agreed that the results of treatment of parenchymatous syphilis, whether by oral, intramuscular, or intravenous routes, have been disappointing. Accordingly, neurologists have been casting around for other and more efficient methods of treatment.

Pyrexial Treatment of Neuro-syphilis and especially of Paralytic Dementia.

It has long been a matter of clinical experience that general paralytics are often benefited as regards their symptoms if they happen to become infected by an intercurrent acute fever such as erysipelas or enteric fever. To inoculate a patient with a serious specific fever of this sort, however, is neither practicable nor judicious. Other means have accordingly been suggested to induce a harmless pyrexia accompanied by leucocytosis and other blood changes, as a consequence of which it is hoped to modify and even to destroy the syphilitic organism and its toxin.

For this purpose von Wagner[23] some years ago began to treat cases of paralytic dementia by repeated hypodermic injections of Koch's tuberculin, commencing with doses of 0.5 to 1 mg., waiting a couple of days, and increasing the dose to 5 or 7 mg., then gradually raising it to 10, 20, or even 30 mg. A sufficient quantity was given to induce a temperature of 102° F. Friedländer and others have recorded a number of cases thus treated and have claimed encouraging results. In several of Friedländer's cases not only did the mental systems improve, but the pupillary reflexes are said to have returned and the knee-jerks, previously absent, reappeared. Personally I have not tried this treatment, for the reason that tuberculin is a two-edged weapon with a risk of lighting up latent tuberculous lesions elsewhere.

Another method is to give the patient an intravenous inoculation of blood obtained from another individual suffering from malaria. Thus v. Jauregg, by injecting subcutaneously 1 c.cm. of malarial blood withdrawn during the febrile phase of the disease, claims to have secured long remissions in 3 out of 9 patients with paralytic dementia.

A third and probably a safer method of inducing artificial pyrexia is by means of large intramuscular injections of sodium nucleinate, as specially studied by Donath.

Some years ago (in 1913 and 1914) I made a number of observations on this method of treatment, but with only moderately encouraging results.[23] Remissions in the mental symptoms were obtained, together with a diminution in the lymphocytosis of the cerebro-spinal fluid lasting for three to fifteen months, but in none of my six cases was there a permanent cure. Nor has Donath recorded any instance of permanent return to normal.

More recently Fischer and Wiechowski[8] have employed an albuminoid substance named "phlogetan." This is injected either subcutaneously or intramuscularly. They state that its action is more intense than that of nuclein, that it produces a fall of blood pressure and increase of pulse rate, but without fever. In paralytic dementia they claim similar but more active results with this remedy than with nuclein

In tabes treated by phlogetan combined with neo-salvarsan they record improvement, with subsidence of crises and of sphincter troubles.

Treatment by Quéry's Monkey Serum.

Quéry regards the syphilitic organism as polymorphic and the spirochaetal form as only one particular phase in its life-history. He prepares bouillon cultures from syphilitic sores and, after filtration through porcelain, injects the microbe-free syphilitic toxins into monkeys. From these in turn, four or five days later, when the Wassermann reaction in the blood has attained its height, he secures the blood serum. This monkey serum, after sterilization, is injected hypodermically into the human syphilitic patient daily in doses of 2 c.cm. for twenty-five successive days, being careful to see that an interval of at least a month has elapsed since any mercurial treatment has been employed. He also uses this same serum intravenously and, in cases of neuro-syphilis, intrathecally.

I have only had personal experience of Quéry's serum in a couple of cases; both of them gave negative results.

The first was a man of 45, with well-marked clinical signs of tabes, whose blood gave a positive Wassermann reaction and whose cerebro-spinal fluid contained 59 lymphocytes per cubic millimetre and also gave a strongly positive Wassermann reaction. After five intrathecal injections of monkey serum the physical signs were unchanged, the lymphocytosis of the cerebro-spinal fluid had risen to 77 cells per cubic millimetre, and the Wassermann reaction was strongly positive as before. In view of these findings and of the costliness of the serum, I did not feel justified in persevering with the treatment.

The second case was one of paralytic dementia in a man of 35, who had slight mental confusion, mild depression, Argyll Robertson pupils, no facial or lingual tremors, and absence of the knee-jerk and ankle-jerk on the left side only—an early case, apparently suitable for the treatment, and so considered by M. Quéry's colleague who supplied me with the serum. The patient's cerebro-spinal fluid contained 180 lymphocytes per cubic millimetre and gave a strongly positive (+++) Wassermann reaction. He was given 2 c.cm. of Quéry's serum subcutaneously twice daily. On the day before treatment was commenced the lymphocytosis had fallen to 76 cells per cubic millimetre. The treatment was then assiduously carried out daily for several weeks. A week later the cerebro-spinal fluild was re-examined; its cell content had fallen to 58.7 per cubic millimetre, whilst the Wassermann reaction was still strongly positive as before. The dementia, however, rapidly deepened, the temperature remaining subnormal, and the patient died four weeks after the commencement of treatment. The serum did not appear to exercise any appreciable benefit. On the contrary, one had the impression that the course of the disease was rather hastened. No autopsy could be obtained, the patient being of Israelitic race.

It would, however, be unfair to condemn this or any other method of treatment after so short a trial. Perhaps others here present may have had wider opportunities of using this very costly remedy (price about a guinea a dose); if so, their experience will be of value to us all.

Spinal Drainage.

Dercum[4] is of opinion that whatever good results have been attained by intraspinal therapy (which we shall presently discuss) are mainly due to the withdrawal of diseased cerebro-spinal fluid. He has accordingly introduced treatment by simple drainage of cerebro-spinal fluid, sometimes by itself, sometimes combined with intravenous salvarsan and mercurial inunctions. The patient is placed in the recumbent posture, lumbar puncture is done, and the cerebro-spinal fluid is allowed to escape all day long until some 70 or 80 c.cm. have come away. This procedure is with the object of washing out the syphilitic toxin from the cerebro-spinal subarachnoid spaces and cisternae. It does not profess to attack the spirochaetes in the brain tissue. Hoefer,[11] on somewhat similar lines, performs spinal drainage at the moment of intravenous salvarsan administration, in the hope that whilst the salvarsan is in the circulation as such, and before it has become decomposed into simpler arsenical salts, it may thus be induced to penetrate the nerve substance of the brain and spinal cord.

Personally as yet I have had no experience of this method of treatment, but suggestions from such a master as Dercum must always claim our respectful consideration. I therefore mention it in passing, in the hope that others here present may perhaps have had personal experience which they can pass on to us.

Intraspinal Treatment.

Many modern neurologists have adopted the plan of introducing remedies directly into the cerebro-spinal fluid. The credit of directing attention to this important principle belongs first to Browning and Mackenzie of Glasgow (*Journal of Mental Science*, July, 1909), who proposed the treatment of general paralysis by intraspinal injection of an autogenous salvarsanized serum. Later, and independently, Marinesco[15] of Bucharest in 1911, and our distinguished president of to-day, Professor George Robertson,[20] in 1913, actually carried out the treatment.

Subsequently Swift and Ellis[24] of the Rockefeller Institute in New York, following Marinesco, applied the same method in cases of tabes dorsalis. Later, Ravaut[18] of Paris introduced the plan of administering neo-salvarsan in minute doses directly into the cerebro-spinal fluid. Other modifications have since been tried—for example, the method of Byrnes,[2] who adds mercury perchloride *in vitro* to the patient's serum; or that of Ogilvie,[17] who similarly adds salvarsan; or again, that of Lafora[13] of Madrid, who adds both mercury and neo-salvarsan in suitable doses. The technique of these various intrathecal methods is more or less the same. A lumbar puncture is done in the ordinary way and the therapeutic substance is introduced through the needle, after withdrawing a certain quantity of cerebro-spinal fluid to make room for the remedy and also for purposes of control. In the intervals between the intraspinal injections the patient is assiduously treated with mercury and salvarsan.

Time does not permit of a detailed description of individual cases thus treated. Herewith I subjoin statistical tables of the results obtained in the cerebro-spinal fluid in a series of my own cases of tabes, paralytic dementia, and cerebro-spinal syphilis. These were personally observed and treated by intrathecal administration, either of the patient's own serum, salvarsanized by an antecedent intravenous injection, or of horse serum mercurialized *in vitro*.

My experience of intrathecal administration of salvarsan or neo-salvarsan directly into the spinal fluid, even in the minute doses advocated by Ravaut, is that it possesses no advantages over the other intrathecal methods. On the contrary, I have on two occasions seen it followed by a disastrous complication in the form of acute transverse lesion of the spinal cord—a result which I have never observed in cases treated by ordinary salvarsanized or mercurialized serum.

Mercurialized serum is sometimes specially useful in cases that are intolerant of arsenic, as in a patient of mine in whom salvarsan, even in the smallest dose, induced an intense exfoliative dermatitis.

Considerable difference of opinion has arisen amongst neurologists with regard to the usefulness of intraspinal therapy in neuro-syphilis. Thus, for example, Kaliski and Strauss[12] of New York condemn intraspinal therapy in paralytic dementia—a conclusion with which my own results are in agreement. But they also regard the intraspinal treatment of tabes by salvarsanized serum as of doubtful value. This is contrary to my own experience. In support of their conclusion they contend that the amount of arsenic present in salvarsanized serum is infinitesimal in amount and of no spirochaeticidal value. It seems to me, however, that they do not take into consideration the probability that it is not merely the arsenic *per se* but the antibodies which it calls forth in the blood that are the therapeutically active agents in the injected serum. Kaliski and Strauss also dispute the relative impermeability of the choroid filter to mercury and salvarsan, and believe that remedies reach the cerebro-spinal fluid equally well whether administered intravenously or intrathecally. Roberts[19] of Liverpool, however, has found no trace of arsenic in the cerebro-spinal fluid after intensive intravenous salvarsan treatment, whereas he has shown the presence of arsenic in 19 cases out of 29 one week after intrathecal injection.

Personally I have observed such encouraging results from intraspinal therapy in tabes and cerebro-spinal syphilis that I do not feel justified in discarding this method. In this conclusion I am supported by several other observers both in this country and in America. Schaller and Mehrtens,[21] comparing a series of 14 cases of tabes, 11 cases of cerebro-spinal syphilis, and 1 case of paralytic dementia treated by intravenous and intramuscular therapy alone, with another series of 42 tabetics, 21 cases of cerebro-spinal syphilis, and 12 cases of paralytic dementia treated intraspinally by salvarsanized serum, are of opinion that intraspinal treatment is definitely superior to intravenous and intramuscular methods, especially in its effectiveness in clearing up the cerebro-spinal fluid: 48 per cent. of their cases became clear through the use of intraspinal methods as compared with 19 per cent. with the old intravenous method.

TABLE I.—*Intraspinal Serum Treatment of Tabes.*

Case No.	Sex and Age.	Before Treatment. Blood W.R.	C.-S. Fluid. Cells.	C.-S. Fluid. W.R.	No. of Injections.	After Treatment. Blood W.R.	C.-S. Fluid. Cells.	C.-S. Fluid.	Remarks.
1	M. 41	+	26.7	++	7	+	16.7	+	
2	M. 64	+++	487.0	+++	4	++−	35.4	+−−	Died of Addison's disease (confirmed histologically).
3	M. 63	−−−	137.0	+++	10	−−−	10.4	−−−	Seen 7 years later; no ataxia; knee and ankle jerks still absent.
4	M. 44	+++	322.6	+++	6	−−−	24.1	−−−	
5	M. 32	+−−	33.0	+++	6	−−−	2.4	+++	Examined 7 years later: no fresh symptoms.
6	M. 52	−−−	10.1	+++	6	−−−	10.7	+++	
7	M. 52	−−−	44.0	+	6	−−−	4.0	−−−	
8	M. 45	+++	17.9	+++	5	−−−	4.0	+++	
	*					−−−	23.8	+++	Recurrence of lightning pains with pleocytosis of C.S.F.
9	M. 42	+++	72.5	+++	6	−−−	17.1	+−−	
10	M. 53	+−−	251.0	+++	5	+−−	6.0	+++	
11	F. 54	−−−	21.4	+++	2	−−−	44.0	−−−	Treatment not persevered with.
12	F. 55	+	243.4	+++	7	+	37.6	+++	Clinically improved.
13	M. 41	−−−	53.4	−−−	5	−−−	12.0	−−−	
14	M. 44	−−−	62.7	+++	4	−−−	6.0	+	
	*						3 3	+	No fresh symptoms after 5 years.
15	M. 55	−−−	26.7	+−−	2	−−−	25.4	−−−	Died of cardiac ailure 2½ weeks after second treatment.
16	M. 42	+++	15.5	+++	5	−−−	4.6	−−−	
17	F. 52	+++	93.6	+++	2	−−−	32.4	+−−	Treatment not persevered with.
18	M. 35	−−−	120.0	+++	4	−−−	5.0	++−	
	*						6.4	−−−	No fresh signs 5 years later, but still had lightning pains.
19	F. 44	−−−	50.7	++−	4	−−−	18.7	+−−	
20	F. 34	−−−	313.0	+++	3	−−−	3.1	−−−	
21	M. 34		205.9	+++	5		7.3	−−−	Mercurialized horse serum.
22	M. 45	+	108.0	+++	4		13.3	+++	Mercurialized horse serum.
23	M. 44	+−−	18.7	+	3	−−−	3.8	+−−	
24	M. 52	+	54.7	+++	3	+	18.0	+++	Pains disappeared. Ataxia improved.
25	M. 38	+++	13.1	+++	2	++−	8.6	++−	Treatment not persevered with.
26	M. 45	+−−	103.3	+++	5	+−−	6.4	+−−	
27	F. 55	−−−	26.7	+++	3	+−−	10.0	+++	Treatment suspended owing to cardiac feebleness.
28	F. 35	+	62.0	+++	2	+	32.0	+++	Treatment not persevered with.
29	M. 32	+	213.0	+++	8	+−−	6.7	+−−	
30	M. 50	−−−	27.0	+++	3	−−−	61.0	−−−	Ankle-jerks previously absent, reappeared.
31	M. 36	+++	27.5	+++	5	+−−	13.4	+−−	
32	M. 51	+−−	149.4	+++	5	±−−	5.4	+−−	
33	F. 55	+	162.7	+++	5	+	6.6	+++	
34	M. 45	+	6.4	+++	3	+	8.0	+++	Retention of urine and temperature 102° after injection.
	§	+	8.0	+++	2	+	4.0	+++	Bladder symptoms ceased. No fresh symptoms.
35	M. 29	±−−	13.3	+++	3	−−−	27.4	+±−	Treatment not completed.
36	M. 68	+++	29.4	+++	5	+++	28.6	+++	
37	M. 37	−−−	81.3	+++	3	−−−	5.5	−−−	
38	M. 39	+	12.0	+++	6	−−−	7.3	+++	
39	M. 44	+	18.7	+++	5	+	17.3	+++	Improved.
40	F. 51	+±−	36.1	+−−	5	−−−	7.9	−−−	A year later developed gumma of clavicle.
41	M. 57	−−−	90.9	+++	4	−−−	3.6	+++	Case 42: Intolerant of salvarsan (exfoliative dermatitis). Treated by mercurialized horse serum.
42	M. 37	+−−	100.1	+++	7		28.9	+−−	
43	M. 56	+++	48.6	+++	6	++−	16.9	++−	
44	M. 43	+++	141.3	+++	5	−−−	10.6	++−	

* = Re-examined § = Second treatment.

TABLE II.—*Intraspinal Serum Treatment of Tabo-Paralysis.*

Case No.	Sex and Age.	Before Treatment. Blood W.R.	C.-S. Fluid. Cells.	C.-S. Fluid. W.R.	No. of Injections.	After Treatment. Blood W.R.	C.-S. Fluid. Cells.	C.-S. Fluid. W.R.	Remarks.
1	M. 41	+++	69.4	+++	3	+++	13.4	+++	Progressive mental deterioration.
2	M. 40	−−−	48.1	+++	6	−−−	23.2	+++	Progressive mental deterioration.
3	M. 40	+−−	44.0	+++	6	−−−	4.6	+−−	Mental symptoms appeared 9 months later.
4	M. 40	+	17.4	+++	3	+	5.3	+++	Progressive mental deterioration.
5	M. 54	−−−	123.0	+++	4	−−−	6.9	++−	Mental symptoms 9 months afterwards.
6	M. 36	+	46.7	+++	6	−−−	16.0	+++	*In statu quo.*

TABLE III.—*Intraspinal Serum Treatment of Paralytic Dementia.*

Case No.	Sex and Age.	Before Treatment. Blood W.R.	C.-S. Fluid. Cells.	C.-S. Fluid. W.R.	No. of Injections.	After Treatment. Blood W.R.	C.-S. Fluid. Cells.	C.-S. Fluid. W.R.	Remarks.
1	M. 42	+−−	120.0	+++	6	−−−	2[illegible].4	−−−	Definite clinical improvement.
2	M. 41	+++	94.8	+++	7	−−−	22.0	+	Mental symptoms disappeared; returned to business.
3	M. 42	+++	412.0	+++	6	+−−	14.1	++−	Returned to work as schoolmaster.
4	M. 39	−−−	271.0	++−	6	−−−	1.4	−−−	Mental symptoms cleared up; served in army.
5	M. 31	+++	51.0	+++	6	++−	8.9	+++	Cessation of fits; mental improvement.
		++−	9.8	+++	5	+−−	15.6	+++	Transient mental improvement.
		+−−	28.6	++−	5	−−−	6.2	+−−	Fits recurred; died 5 years after first series.
6	M. 40		52.0	+++	5*		21.3	+++	
7	M. 45	+	10.7	+++	6	+	5.0	+++	Remission in mental symptoms.

* Mercurialized horse serum.

My own cases corroborate the conclusions come to by Schaller and Mehrtens, that the most promising cases for intraspinal therapy are those of meningo-vascular neuro-syphilis, that of the parenchymatous group tabetic cases are relatively the most favourable, whereas paralytic dementia and optic tabes are generally unfavourable. Cases of tabo-paralysis, in my experience, do badly, in contrast with pure tabetics.

Cases of the intraspinal serum treatment of tabes, tabo-paralysis, and paralytic dementia are recorded in Tables I, II, and III.

The following cases are illustrative of *intraspinal treatment by neo-salvarsan directly into the lumbar fluid.*

Case 1.—L. S. L., male, aged 44, suffering from tabes, was seen by me in February, 1914. On examination his blood gave a completely negative (−−−) reaction; the cerebro-spinal fluid showed 85.2 cells per cubic millimetre and a weakly positive (+−−) Wassermann reaction. He received six injections of neo-salvarsan. After treatment the Wassermann reaction, both for blood and cerebro-spinal fluid, remained as before, the cell content of the cerebro-spinal fluid being 12 per cubic millimetre. After marked improvement the patient had a sudden relapse, and then gradual improvement again.

Cases of General Paralysis of the Insane.

Case 2.—R. M. S., male, aged 39. Before treatment his cerebro-spinal fluid contained 39.2 cells per cubic millimetre and the Wassermann test was strongly positive. After treatment (five injections) the cell content of the cerebro-spinal fluid was 4 and the Wassermann reaction still strongly positive. There was no change in his clinical condition.

Case 3 (Case 2 of Table III).—H. N., male, aged 42, was treated by me in March, 1914. Before treatment his blood gave a negative (−−−) Wassermann reaction, but his cerebro-spinal fluid was strongly positive (+++); the fluid contained 89.7 cells per cubic millimetre. After treatment (four injections) the blood remained negative, and the cerebro-spinal fluid was only weakly positive (+), the cell content being 6.9 per cubic millimetre. A week after the fourth injection of neo-salvarsan (9 mg.) he developed signs of transverse spinal cord lesion at the level of the fourth lumbar segment.

Case 4.—M. E. B., male, aged 43; seen in March, 1914. Before treatment his cerebro-spinal fluid contained 235.8 cells per cubic millimetre and the Wassermann test was strongly positive (+++). After treatment the Wassermann reaction was still strongly

TABLE IV.—*Intraspinal Serum Treatment of Cerebro-spinal Syphilis.*

No.	Initials.	Date.	Age.	Before Treatment.			No. of Injections.	After Treatment.			Clinical Phenomena.	Results.
				Blood.	Cerebro-spinal Fluid.			Blood.	Cerebro-spinal Fluid.			
				W. R.	Cells.	W. R.		W. R.	Cells.	W. R.		
1	E. H.	Aug., 1914	57	+++	26.6	+++	6	−−−	42.7	+++	Irregular pupils; spastic paresis	No advance in symptoms.
2	H. L.	Sept., 1914	36		103.0		3		13.0		Transient left hemiplegia	Died of pulmonary tuberculosis 7 months later.
3	A. E. B.	Oct., 1914	32		88.6	+++	8		9.4	+++	Epileptiform fits	Fits ceased; returned to military duty.
4	F. B.	Jan., 1915	52		88.0	+	7	−−−	78.7	+	Pain and paraesthesia in legs; Kernig positive; plantars flexor	Paraesthesia, etc., disappeared. Kernig negative.
5	P. C.	March, 1915	39	−−−	240.0	−−−	4	−−−	4.0	−−−	Right monoplegia of arm; slight aphasia	Right grasp still weak; aphasia disappeared.
6	H. H.	May, 1919	40	+	4.0	+++	5	−	12.6	+++	Paralysis of upper limbs with increased deep reflexes in legs and extensor reflexes	Partial recovery.
7	S. S.	Aug., 1919	49	+	37.3	+++	5	+	9.4	+++	Diplopia; paraesthesia of right face	Symptoms cleared up.
8	H. K.	Sept., 1919	48	−−−	87.0	+++	4	+	6.0	+++	Anaesthesia of S4 and S5 areas with bladder delay	*In statu quo.*
9	P. J. L.	Oct., 1919	56	+	17.3	+++	4	+	9.4	+++	Postero-lateral sclerosis	*In statu quo.*
10	Mrs. M. A. C.	Nov., 1919	47	+	85.0	+++	4	+	11.0	+++	Irregular pupils; spasticity of legs with ataxia	No advance in symptoms.
11	G. H. B.	March, 1920	48	−−−	128.6	+++	7	−−−	12.3		Epileptiform fits	Fits much diminished.
12	W. G. E.	March, 1920	61	−−−	130.3	+++	6	−−−	12.6	+++	Spastic paraplegia	Improved.
13	R. C.	April, 1920	45	+	136.0	+++	6	−	5.3	+++	Limb pains; enuresis; left extensor reflex	Pains disappeared; bladder improved.
		Re-examined Feb., 1921		−	17.4	+	6	−	16.0	−−−	Enuresis	Bladder cleared up; free from symptoms in Feb. 1922.
14	J. L.	May, 1921	47	+	18.7	+++	4	+	16.0	++−	Left hypoglossal palsy; postero-lateral sclerosis	*In statu quo.*
15	W. J.	Aug., 1921	64	+−−	33.4	+++	3	+	10.0	+++	Argyll Robertson pupils; postero-lateral sclerosis	Legs improved.

positive, the cell content being 8 per cubic millimetre. Four days after the last injection the patient developed flaccid paraplegia, with absent deep jerks and flexor responses. He died three months later.

Case 5.—W. D. H., male, aged 26; seen in March, 1914. Before treatment the cell content of his cerebro-spinal fluid was 114.8 per cubic millimetre; the Wassermann test was strongly positive (+++). He received two intraspinal injections of neo-salvarsan. On examination after treatment his cerebro-spinal fluid was still strongly positive to the Wassermann test, the cell content being 47.7 per cubic millimetre. A week after the second injection he developed haemorrhagic cystitis, and died suddenly twelve days later. *Post-mortem* examination showed the kidneys and liver to be healthy; no signs of arsenical poisoning were discovered; there was old thickening of the frontal meninges.

Case 6.—B. L., male, aged 33, came for treatment in March, 1914. On examination his cerebro-spinal fluid showed a cell content of 33 per cubic millimetre, and gave a weakly positive (+) Wassermann reaction. He was given three intraspinal injections of neo-salvarsan, following which his cerebro-spinal fluid contained 40 cells per cubic millimetre, and the Wassermann reaction remained as before. He died of acute meningitis.

Intracranial Methods.

The lumbar region, although the easiest, is not the only route through which remedies may be introduced directly into the cerebro spinal fluid. Substances introduced by the lumbar route have a long distance to traverse before reaching the cranial cavity, and even then only a part of the injected fluid reaches the brain. It is therefore not surprising that intraspinal treatment is less efficient in cerebral than in spinal syphilis. Accordingly Neisser and Pollack suggested a method of cranial puncture by drilling through an area of frozen scalp, perforating the subjacent cranium, and injecting the remedy beneath the dura directly on to the surface of the brain. This has been carried out by Marinesco and Minea,[16] by Sicard and Reilly,[22] and others, but as a routine method it does not appeal to the ordinary clinician. Another plan is to enter the basal subarachnoid cistern through the orbit, penetrating the sphenoidal fissure with a hollow needle, as proposed by Beriel[1] of Lyons. This however, is awkward, and includes a risk of wounding the cavernous sinus.

A more straightforward surgical procedure is to do a frank trephining operation close to the middle line of the vertex and then inject the remedy directly into one or other lateral ventricle by perforating the corpus callosum—the so-called *Balken-stich* of Anton and Bramann. This has been carried out in Germany by Förster[10] and in this country by myself and by my colleague Harry Campbell,[3] in conjunction with Sir Charles Ballance. I have not been favourably impressed with the results thus obtained. The following personal example may be quoted:

A man of 44 came under my observation in 1919 with typical signs of early general paralysis. He was excited and delusional, but without dysarthria. There was a strongly positive (+++) Wassermann reaction in the blood and cerebro-spinal fluid, also a lymphocytosis of the fluid amounting to 104 cells per cubic millimetre. After trephining, four intraventricular injections of salvarsanized serum were given by Sir Charles Ballance at intervals of one to two weeks. The Wassermann reaction in the blood and cerebro-spinal fluid remained unaltered, but the cell content receded to 20, 16, and then to 12 per cubic millimetre. The mental symptoms, however, continued to progress steadily, and the patient died six months later.

Intracisternal Treatment.

All the foregoing methods of reaching the intracranial subarachnoid space, with the exception of the orbital puncture of Beriel, necessitate more or less damage to the brain structures. Moreover, there is a definite risk attached to repeated cranial operations. For this reason it seems to me that the method of intracisternal puncture through the occipito-atlantoid ligament, as described by Wegeforth, Ayer, and Essick,[26] offers many advantages. Cisternal puncture, once the necessary technique has been mastered, is carried out as readily as lumbar puncture. The fluid thus introduced into the cisterna magna is carried forwards, in the current of the cerebro-spinal fluid, throughout the subarachnoid cisterns. It permeates the membranes from base to vertex, reaching every part of the cortex. Curiously enough, one finds that the amount of discomfort to the patient is less than after lumbar puncture.

The clinical results in cerebro-spinal syphilis in some cases have been striking. The following is an illustrative example of cerebral syphilis successfully treated:

The patient was a man of 43 who had typical sensory Jacksonian fits, affecting the right upper limb and right side of the tongue, together with transient dysarthria. Apart from absence of the left abdominal reflex and a somewhat indefinite plantar response in the right foot, no abnormal clinical signs were made out, whether in the cranial nerves, sensory, motor, or reflex functions. The cerebro-spinal fluid, however, contained 142.2 lymphocytes per cubic millimetre and gave a strongly positive (+++) Wassermann reaction. The Wassermann reaction in the blood was moderately positive (+±−). He was given five intracisternal injections of salvarsanized serum. The fits ceased immediately after the first injection. At the end of the series the cells had fallen to 9.7 per cubic millimetre and the Wassermann reaction was completely negative (−−−). The blood reaction was now feebly positive (+−−). Four months later the cerebro-spinal fluid was re-examined and contained 6.3 cells per cubic millimetre with a negative (−−−) Wassermann reaction. When seen twelve months after the original examination he was free from clinical abnormality, the abdominal and plantar reflexes were normal and

TABLE V.—*Intracisternal Serum Treatment of Neuro-Syphilis and General Paralysis of the Insane.*

No.	Initials.	Date.	Age.	Before Treatment.			No. of Injections.	After Treatment.			Clinical Phenomena.	Results.
				Blood.	Cerebro-spinal Fluid.			Blood.	Cerebro-spinal Fluid.			
				W. R.	Cells.	W. R.		W. R.	Cells.	W. R.		
1	W. L. W.	Nov., 1920	43	+±−	142.2	+++	5	−−−	6.3	−−−	Jacksonian fits	Symptoms entirely disappeared; remained well 1½ years later.
2	H. L.	Oct., 1920	30	+	44.0	+++	4	+	2.6	+++	Early general paralysis of the insane; facial tremors	Tremors less.
3	C. R.	June, 1921	53	−	13.3	+++	3	−	9.3	+++	Right hemiplegia, vertigo, fits	*In statu quo.*
4	W. B. W.	July, 1921	40	+++	74.7	+++	4	+±−	5.6	+++	Emotional attacks; early G.P.I.	Mental condition improved.
		Re-examined June, 1922			25.6	+++					Slight mental deterioration	Resuming treatment.
5	H. B.	May, 1922	42	+	189.4	+++	4	+	9.0	+++	Unilateral Argyll Robertson pupil; weakness of right hand; extensor plantar reflexes	Rapid improvement in hand weakness.
6	F. M. B.	June, 1922	65	+++	153.9	+++	3	++−	21.9	+++	Emotional attacks. No physical signs, apart from blood and cerebro-spinal fluid	Rapid improvement clinically.

equal, and he had had no return of his Jacksonian fits. The following is a record of the conditions in his blood and cerebro-spinal fluid:

Date.	Blood Wassermann.	Treatment, Intravenous N.A.B.	Cerebro-spinal Fluid.		Treatment, Intracisternal salvarsanized serum.
			Cells.	Wassermann.	
Nov. 3 ...			142.19	+++	
Nov. 15–16 ...	+±−	0.45	81.4	++−	35 c.cm.
Nov. 29–30 ...	+±−	"	68.4	+−−	"
Dec. 13–14 ...	+±−	"	62.5	−−−	"
Dec. 27–28 ...	+±−	"	27.08	−−−	"
Jan. 10–11 ...	+−−	"	9.7	−−−	"
May 2 ...			6.3	−−−	
Nov. 17 ...	−−−				

With regard to early paralytic dementia, I have not yet treated a sufficient number of cases by the intracisternal method to justify definite conclusions. So far, the results have been better than by any other method I have tried. In selected cases I have usually obtained a rapid remission both in the mental symptoms and in the condition of the cerebro-spinal fluid. How long such remissions will last remains to be seen. It seems to me, however, that early cases of general paralysis should at least be given a trial with this method. The cases which are most likely to benefit are patients in the earliest recognizable stage of the disease, long before they have reached the stage of certifiable insanity, whose symptoms, both mental and physical, are as yet slight, although the cerebro-spinal fluid already shows well-marked syphilitic changes.

In this connexion I may be allowed to quote the experience of Ebaugh,[7] who employed serum salvarsanized *in vitro* and administered by the intracisternal route in a series of 28 (apparently unselected) asylum cases of what he terms the "average" type, but which we would classify as moderately advanced. In 12 of Ebaugh's cases the cerebro-spinal fluid lost its pleocytosis and its globulin reaction, but the clinical results, as might be expected in patients with advanced parenchymatous cortical changes, were disappointing, except in one instance, apparently the only patient whose malady was of short duration, in whom marked clinical improvement occurred.

Experience goes to show the importance of choosing for treatment cases of general paralysis at the earliest recognizable stage, before the onset of profound degenerative changes. Early diagnosis is an essential preliminary for hopeful treatment. No method of treatment can be expected to replace destroyed nerve elements in the central nervous organ.

CONCLUSIONS.

1. Every case of neuro-syphilis, diagnostically established by combined clinical and serological tests, demands assiduous treatment of the general syphilitic infection by every means at our disposal. Antisyphilitic remedies, including mercury, iodides, arsenobenzol, etc., are to be administered by the most efficient route, whether by the mouth, by inunction or fumigation, by intramuscular injection, or by intravenous injection into the blood stream. In no case should our remedies be directed exclusively to the nervous system.

2. In gummatous and meningo-vascular neuro-syphilis the foregoing antisyphilitic treatment is usually all that is necessary.

3. Some cases of parenchymatous syphilis respond, but the majority are resistant, to general antisyphilitic treatment, even when carefully and thoroughly carried out. Such cases are those which should be selected for supplementary sub-arachnoid treatment, whether intrathecal or intracisternal.

4. Intraspinal treatment by salvarsanized serum prepared from the patient's own blood, or by human or horse serum mercurialized *in vitro*, is specially suitable for cases of tabes and of cerebro-spinal syphilis, provided the cerebro-spinal fluid shows evidences of active meningeal reaction. It is also suitable for meningo-vascular spinal syphilis when resistant to ordinary treatment.

5. The direct intraspinal administration of arsenobenzol into the cerebro-spinal fluid is liable to produce acute softening of the spinal cord and should be discarded.

6. Cases of general paralysis, of optic tabes, of tabo-paralysis, and of tabes with negative reactions in the cerebro-spinal fluid, are not likely to benefit by intraspinal treatment.

7. Cases of meningo-vascular cerebral syphilis benefit much by intracisternal administration of salvarsanized serum.

8. General paralysis, if recognized in the early stage, is definitely benefited by intracisternal treatment. This method is superior in efficacy to intraventricular operations and entails much less risk to the patient.

9. Pyrexial treatment of early general paralysis—for example, by tuberculin, nuclein, etc.—may induce temporary remissions in the disease. So also can simple drainage of the cerebro-spinal fluid, combined with general antisyphilitic treatment.

10. Advanced cases of general paralysis, with extensive destruction of cortical nerve elements, are hopeless for curative treatment by any method whatever.

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SOME OBSERVATIONS ON THE TREATMENT OF NEURO-SYPHILIS.

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THE time is undoubtedly ripe for a pause and look round in the field of neuro-syphilis and its treatment. Immense as is the activity in this department of neurological therapeutics the question forcing itself on our attention is, "Are we getting anywhere?" Have the sixteen or seventeen years since the discovery of the spirochaete of syphilis, the twelve or fifteen since the introduction of "606" and "914," seen corresponding advances in treatment as compared with the years that preceded these epoch-marking events? I have had the curiosity to refresh my memory with a glance at the routine treatment at the National Hospital in the days of my residence there, from 1904 to 1908, and apart from the fact that some members of the staff as then constituted bravely stuck to mercurial treatment in so-called parasyphilis or metasyphilis the methods adopted were therapeutically vague and general, no doubt inevitably so. In comparison, the technique in vogue to-day has at least a pretence to vastly greater specificity, but candour compels us to admit there is still far too much of the "hit or miss" element in our treatment. I may say at once, to define my own position, that I believe we are on right lines in our efforts to reach the nervous system with therapeutic momentum, via the blood or via the cerebro spinal fluid, or both, but precision, certainty, and completeness of result are still lacking.

In our search for the causes of this imperfect state of affairs several points suggest themselves for consideration. One undoubtedly is our ignorance of the exact stages of development and intrasomatic existence of the spirochaete of syphilis. The clinician is frequently confronted with cases in which an extremely long "resting stage"—whatever it be, histologically speaking—for the *Spirochaeta pallida* must be assumed.

Thus a female patient, the subject of classical tabes dorsalis, developed symptoms at the age of 50. She had been married when 25 years old, and her husband, her equal in age, admitted syphilis at the early age of 16. Examination by the usual tests showed his nervous system to be entirely normal. Apparently, therefore, since the wife was *virgo intacta* at the time of marriage, the germ of syphilis had lived in the husband's tissues for nine years, had been communicated to the wife, presumably via the testicular fluid, and had developed into neuro-syphilis in her spinal cord no less than thirty-four years after the original male infection.

A case like this gives one furiously to think. If Wassermann tests were applied at intervals, notwithstanding the apparent health of the subjects concerned, in every case where syphilis has been contracted, however long before, I can scarcely doubt that its progress on the way to neuro-syphilis would be detected to the gain of the patient. In a regrettable majority of instances the tests are resorted to only when clinical symptoms make their appearance, which is often already too late.

A second unsatisfactory element in the treatment of neuro-syphilis resides in our inability to distinguish between symptoms due to the local presence of the spirochaete, those assignable to toxins generated by it, and those that are the outcome of structural changes developing in its train. Nowadays we do not believe—most of us, I suppose, at any rate—that either general paralysis, tabes, or tabetic optic atrophy progresses inevitably to an unfavourable issue once the degenerative process is initiated. On the contrary, there is every reason to urge that the continuance of the morbid process in these conditions is essentially due to the continuance of the activity of *Spirochaeta pallida*. No one of them has for its histological basis a primary parenchymatous degeneration of neural tissue alone, and I for one strongly object to the distinction rather in vogue at present between parenchymatous neuro-syphilis and meningo-vascular neuro-syphilis. It is notorious that in general paralysis both meningo-vascular and ependymal changes are as obvious as those of the nerve parenchyma; tabetic optic atrophy is no primary systemic neuronal disease, but is consecutive to exudative processes along the course of the nerve, derived from the pial sheath and showing themselves mainly in its intracranial and foraminal sections; and if Richter's recent work on the histogenesis of tabes is duly confirmed that disease is caused by the effects on the dorsal roots of their entanglement in granulation tissue, itself derived from the local action of the spirochaete, in the subarachnoid recess on the "radicular nerve" of Nageotte. Theoretically, were the cause removed the pathological processes involved in the so-called parenchymatous varieties of neuro-syphilis should come to an end. Every neurologist must have had experience of two interesting groups of cases, one in which tabes, followed over a long period of years, more or less "cures itself," and another in which certain objective signs of neuro-syphilis are found in individuals who are perfectly healthy and have no complaint of a subjective kind.

As an illustration of the first of these groups I take the case of a patient with tabes, whose disease began in 1883. He attended the National Hospital in 1889, and was then extremely ill with obvious tabetic symptoms, including gross ataxia. After some years of treatment he disappeared. He turned up again in 1919, having had no treatment whatever for about twenty years, and was in every way vastly improved on his former state. On examination little else was found beyond fixed pupils and absent deep reflexes, and Wassermann tests were negative in blood and spinal fluid. The suggestion is that the tabetic process has "run itself out," presumably because the activity of the virus has died down.

To illustrate the second group I select the case of a patient who consulted me for a moderate occupation neurosis (right arm). In routine examination I found a double Argyll Robertson pupil and absent knee and Achillis jerks. Inquiry elicited the fact of the acquisition of syphilis some fifteen years previously. Tests in blood and spinal fluid proved completely negative in every respect. I can only regard the objective signs as "cicatrices" of a neuro-syphilis that, as far as the virus is concerned, is "dead."

From cases such as these the deduction is legitimate that progression of symptoms in so-called metasyphilis depends in reality on continuance of the activity of the *Spirochaeta pallida*. If, however rarely, such self-cures are attainable, we cannot allow ourselves to be beaten by neuro-syphilis. We should be able to produce similar results by our treatment from without. We may not be able to modify structural changes following the ravages of the syphilitic organism—after all, a man may go through life with absent deep reflexes or fixed pupils and be no whit the worse for it—but at least we can concentrate on what appear to be the signs of active toxicity on its part or of its actual presence in the central nervous system. In this connexion I shall cite later the case of a general paralytic in which there was good clinical evidence to suggest that some of the cardinal signs of that condition—for instance, the megalomania—are in fact the expression not of structural degeneration in the cortex but of toxic action, and the case of a tabetic where, similarly, symptoms usually regarded as structural have vanished under treatment. As is known, cases of return of knee-jerk in that disease, and of disappearance of the Argyll Robertson phenomenon, have been recorded. The truth probably is that in cases of neuro-syphilis structural deterioration does not set in as early as has been supposed, and that speedy and intensive treatment should never be hesitated over merely because there is, apparently, evidence of actual neuronal disintegration.

A third source of trouble in neuro-syphilitic treatment is commonly attributed to inaccessibility of the spirochaete in the tissue spaces of the central nervous system. I am bound to say I have never been impressed by the histological arguments adduced in support of the contention. If the spirochaete can travel in the tissues so can drugs, if in appropriate medium. Neural elements live because they are supplied with suitable pabulum via the ordinary tissue paths, and these are surely open to the conveyance of antibodies as well as of organismal products. My view of the "incurability" of general paralysis is largely that in that disease the spirochaete has started before the pistol and breasts the tape without its arsenical competitor ever having a chance of getting level with it.

Leaving these preliminary considerations, what I propose to do is to give the Section an outline of therapeutic failures and successes by the various methods I have prosecuted during the last ten years, illustrating by selected cases, and indicating the conclusions that may fairly be drawn therefrom. I shall select only the older cases which I have been able to follow up. While from time to time I have had recourse to a number of somewhat different techniques, for the sake of brevity I may state at once that the best results have been obtained with (1) mercury and salvarsan (or its substitutes) intravenously; (2) mercury, salvarsan, and salvarsanized serum intraspinously; (3) mercury and mercurialized serum, also by the intraspinous route. My experience of cisternal technique has been too recent for results to be justifiably quoted in this communication; in passing I may say that in view of the known circulation of the cerebro-spinal fluid there cannot be any material difference in effect between introduction of medicaments at one end of the cord and the same procedure at the other.

Cases of General Paralysis.

Of many cases treated during the last ten years, the following one is the solitary example of apparent success, and, as will be seen immediately, the sequel is doubtless open to adverse criticism.

The patient, a male aged 32, came under observation in June, 1915. He then presented the typical symptoms of general paralysis, more particularly those on the psychical side; he exhibited megalomania to a striking degree and "never felt better in his life"; shortly afterwards he was certified and admitted to a private asylum. Lumbar puncture revealed 265 cells per cubic millimetre, with strongly positive Wassermann and Nonne-Apelt reactions. Treatment by salvarsanized serum intrathecally was forthwith commenced and continued regularly for approximately a year at fortnightly intervals. A course of mercurialized serum was substituted for it after about six or eight months. Altogether the patient received some twenty-five intrathecal injections. By the summer of 1916 he had so far recovered as to be allowed to leave the asylum, to which he never returned. The last lumbar puncture fluid examination showed only an occasional mononuclear cell; both chemical reactions were much weakened, but neither was wholly negative.

In the autumn of the same year he returned to business and made much money on the Stock Exchange. After a most successful year's work he was taken ill with chest trouble and died, according to his parents' statement, of phthisis in the autumn of 1917. To explain this it must be pointed out that the patient undoubtedly was tuberculous; he had wintered at Davos before the general paralytic symptoms developed, was known to have had a tuberculous larynx, and tubercle bacilli had been found in his sputum on several occasions.

Critical consideration of this case of general paralysis will allow the contention that the improvement was much more than merely one of the "remissions" occasionally seen in that disease, while the fact of the succession of the return to nervous health by a year's normal work in business must be admitted almost to justify the word "cure." On the other hand, when I last saw the patient, some six months before his death, he was still under the idea that the asylum sojourn was unnecessary and had in reality done him harm. Again, the concurrent tuberculosis is a very unusual feature and complicates the case to some degree; quite conceivably the tuberculous infection may have exercised a mitigating effect on the other.

The degree of success attained in this instance, gratifying as it was, is therefore somewhat qualified. It was attributed, naturally enough, to the fact that treatment was begun almost as soon as the symptoms were recognized. By way of contrast, however, I select a case also treated intensively from the outset.

The patient, a male aged 30, had had two fits, apparently typical epileptiform attacks, very shortly before coming under observation in March, 1917. As he was occupied in important work during the war these attacks—the very first symptoms—had led to his being sent for expert opinion without delay. On examination he presented slight but unmistakable signs of early general paralysis. A strongly positive Wassermann reaction in both blood and fluid, and 65 cells per cubic millimetre in the latter, with a strongly positive globulin test, completed the diagnosis.

Treatment by intrathecal mercurialized serum was commenced without delay; later it was replaced by salvarsanized serum. Altogether the patient received some twenty-eight treatments by the spinal route. He improved materially at first, but only up to a certain point. The fluid findings were very favourably modified, but the Wassermann reaction never became quite negative. An attack of gastric influenza at Christmas, 1917, pulled him back considerably, and recurrence of the epilepsy, from which he had been completely free, ensued. Treatment nevertheless was continued, but in the autumn of 1918 his friends had to send him to a private asylum, where he died about two years after I first saw him.

Here, then, is a characteristic case of general paralysis treated with assiduity from the commencement and with the patient's full co-operation, but the sequel is that of only too many instances of the affection.

I think I may say with fairness that all the cases of general paralysis I have treated, provided they are tackled at a comparatively early stage, have shown signs of unmistakable improvement at first, and up to a certain point, but thereafter perseverance in treatment has failed to effect any further change. The hopefulness of the procedure at the beginning is always belied later, with the exception of the result in the case first quoted. In spite of these disheartening features, the fact of apparent favourable modification cannot be ignored, and should provide an incentive for further therapeutic research.

Cases of Tabes Dorsalis.

From my experience of a large number of cases of this variety of neuro-syphilis, at all stages, my considered opinion is that persistent intravenous and intraspinous treatment has justified its adoption as a routine method. Among various impressive cases the following may be chosen for illustration:

A woman, aged 50, had the characteristic subjective symptoms of tabes for about twelve months before coming under care in May, 1916, when, on examination, the classical picture of the disease was found—in particular, marked ataxia, rectal incontinence, severe shooting pains, absent deep reflexes, fixed pupils, loss of deep pressure-pain in the legs, and so on. In the blood the Wassermann test was negative; in the fluid a strongly positive globulin reaction, a weakly positive Wassermann, and 30 cells per cubic millimetre indicated the nature of the affection conclusively.

Treatment with mercurialized serum intrathecally was forthwith inaugurated, and this was replaced later by salvarsanized serum. In all, some sixteen injections were thus administered in the course of about eighteen months. The result was eminently satisfactory. Clinically, the pains vanished, the rectal incontinence ceased and never returned, and the ataxia was reduced to a negligible element in the case. At the end of the treatment the cells were less than 5 per cubic millimetre, the Nonne-Apelt test was negative, and the Wassermann test was on the margin of negativity. The patient was seen and re-examined some two and a half years later, and the improvement was fully maintained, though, naturally enough perhaps, the pupils remained fixed and the deep reflexes were still absent. A still later report (July, 1922) informs me that the patient enjoys good health and full bodily activity, and is "better than she has been for years."

Special attention may be directed to the fact that in this case symptoms commonly held to be of structural origin—namely, the rectal incontinence—disappeared as the result of treatment and did not recur. Another example of the favourable modification of symptoms of this class—namely, bladder crises and incontinence—is the following:

A male patient, aged 39, came under care in June, 1916. He had contracted syphilis twelve years previously, and on examination exhibited evidence of tabes dorsalis in the form of typical shooting pains, loss of bladder control, loss of sexual desire and power, ataxia and anaesthesia in the limbs, Rombergism, double Argyll Robertson pupil, and absence of all deep reflexes. The Wassermann reaction was strongly positive, both in serum and fluid. In the course of some two years the patient was given ten injections of mercurialized serum intraspinously, and twelve of novarsenobenzol intravenously. Again, in 1920-21 intravenous and intrathecal treatment was repeated. As a result, the patient has been able to resume his occupation in the marine profession, and at present (June, 1922) has proceeded in the course of his duties on a voyage to the West Indies.

The bladder incontinence and crises have been overcome; the pains are entirely negligible; the ataxia is scarcely noticeable; and sexual desire and power have greatly improved. On the other hand, a fall some six months ago has resulted in what appears to be an incipient Charcot arthropathy of the right tarsus. The pupils and deep reflexes remain as before.

As a contrast to these and similar cases that might be cited we may, for a corrective to too optimistic a purview, glance at the following tabetic history:

A male patient, aged about 45, who had contracted syphilis twenty years before, was found on examination in March, 1918, to show all the usual symptoms and signs of advancing tabes dorsalis. He was thin and pale, and looked ill, yet apparently his attention had been drawn to himself only for about six months, largely through the development of defective bladder control. In the spinal fluid the cells were only 16 per cubic millimetre, the globulin reaction was "faint," the Wassermann test was "very slightly positive." Looking on the case as eminently one for intensive treatment, and persuaded by the comparative mildness of the various tests and reactions that the outcome would be favourable, I initiated treatment, on this occasion with galylized serum intraspinously. During thirteen months some eight injections were administered; later, treatment was continued with intravenous arsenic only, and later still intrathecal medication was again resumed. The clinical improvement of the first nine months was not maintained, and while the cells were reduced to a normal level the globulin and Wassermann tests never became less than "slight," though I expected them certainly to become negative. In the course of the next year the patient's condition gradually became worse, in spite of his own medical attendant's perseverance with intravenous arsenic, and some two years after his coming under observation he died.

I must own to disappointment in this latter case, nor is that tempered by exact knowledge of the reasons for the failure. On the face of it, it appeared more suitable for treatment than many others which have been handled with better result. I can only suppose the methods were not pushed sufficiently; through unavoidable circumstances the injections were given somewhat irregularly, and not in the total amount of some of the others here quoted. Nevertheless in this instance an apparently favourable case did not respond to treatment in any material degree.

My experience in cases of tabetic optic atrophy has been uniformly disappointing, here let it be said. Its treatment is an unsolved problem, for we should get better results than we do.

Cases of Cerebro-spinal Syphilis.

There appears to be a consensus of opinion as to the suitability for and responsiveness to treatment of cases of neuro-syphilis, cerebral or spinal, not belonging to the categories of tabes and general paralysis. The meningo-vascular form, however, has always been more responsive to mercury and iodides than the others, so that the question for the moment is, Has our control over its manifestations been enlarged or strengthened by the adoption of the newer methods with intravenous or intraspinal arsenic? On the whole, and in spite of numerous satisfactory results which might be used in illustration, I cannot say that I am entirely convinced it has. In opposition to what seems, at least to me, to be the usual contention in recent years, I believe that the addition of the arsenical preparations to our antisyphilitic armamentarium has, as far as neuro-syphilis is concerned, proved as great a help in tabes as in cerebro-spinal syphilis, if not indeed greater. In other words, the coupling of arsenic with the well-tried mercury and iodide methods has influenced tabes more than it has the other, in which the latter technique has never really lost caste, so to speak. Be this as it may, just as with the other varieties I am able to quote satisfactory and unsatisfactory instances alike.

It is scarcely necessary to furnish examples of successful treatment of ordinary syphilitic hemiplegia, paraplegia, etc., and of somewhat rarer manifestations, such as syphilitic sciatica, syphilitic amyotrophy, and so on. Routine treatment in all such types of case with the time-honoured mercury and iodides seldom fails to effect material improvement, and the addition of intravenous arsenic is no doubt advisable, but intrathecal medication also has its place in selected instances.

The most striking example of the value of the newer treatment that occurs to me is furnished by a case of meningitis syphilitica acutissima. The patient, a male aged 24, had contracted syphilis in 1918, and some three months later developed sudden symptoms of meningitis, so acute and extreme in degree as at once to lead to a clinical diagnosis of cerebro-spinal meningitis (meningococcal); this was apparently confirmed by lumbar puncture, though no meningococci were found, the cell exudate being predominantly polymorphonuclear, with a moderate amount of mononuclears, chiefly medium and small. A week later it became clear that cerebro-spinal fever could be excluded, and that the case was one of generalized syphilitic meningitis of the acutest variety. A strongly positive Wassermann reaction was obtained in both blood and cerebro-spinal fluid. Mercurial inunction and six intrathecal injections of mercurialized serum effected a marvellous change, and from being at death's door the patient made an uninterrupted recovery. In three months the spinal fluid was completely normal in all respects. Three years later the blood and fluid were again entirely normal.

I do not hesitate to affirm that this case of acute syphilitic meningitis owed recovery to the immediate instillation of antisyphilitic remedies into the subarachnoid space and that no other technique would have served so well. Where there is histological evidence of meningeal irritation by the syphilitic virus in cases of cerebro-spinal syphilis intrathecal medication should be added without fail to mercurial and iodide methods.

On the other hand, some cases of the meningo-vascular kind fail to respond, in spite of every effort.

Thus a male patient, aged 47, who had contracted syphilis at some unknown date previously, came under notice early in 1916 because of a left external rectus paresis, with diplopia. The Wassermann reaction was very strongly positive in the blood. On neurological examination no other objective signs were present. Year after year patient treatment with mercury, iodide, and intravenous arsenic was prosecuted. Altogether some thirty-five or forty intravenous injections of galyl, kharsivan, and novarsenobenzol were administered. Yet no clinical improvement was obtained; on the contrary, the ocular condition spread, cardio-vascular degeneration ensued, and the Wassermann reaction in the serum remained disappointingly positive. Rather less than one year ago the patient died from the cardiac condition.

General Conclusions.

In the treatment of all varieties of neuro-syphilis distinction must be drawn between toxic and structural or degenerative symptoms—that is, as far as such distinction is in the present state of knowledge practicable. As yet we have no certain means of detecting spirochaetal activity except by serum and spinal fluid tests, so that their positivity or otherwise remains the criterion (scientifically a little debatable if useful practically) by which to judge whether treatment should be further prosecuted or not. At the same time, one can never afford to ignore clinical evidence. Like many other investigators, I have found improvement in cell and globulin tests to precede change in the Wassermann test, and I have not a little evidence which goes to prove that noteworthy clinical amelioration may be accomplished notwithstanding a persistently positive Wassermann reaction. It thus becomes a practical question whether the latter is an unfailing index to the actual pathological condition. On the whole, I make it a working rule at present always to aim at complete reaction-negativity, but in not a few instances where marked improvement has been brought about—for example, in cases of tabes—intrathecal or intravenous treatment has been broken off before such aim has been reached, and not, I have found, with any particular disadvantage. Nevertheless it is abundantly obvious that treatment has to be persevered with over long periods, or repeated at more or less regular intervals in courses, if any enduring result is to be achieved.

Within the last few years I have experimented on a fairly wide scale, in cases of so-called parenchymatous neuro-syphilis, with arsenic by the intravenous route only, examining the spinal fluid at intervals to ascertain whether any improvement therein can be thus attained. In several cases such improvement has been procured, yet on the whole the clinical results have been better with intrathecal treatment than without it. I am bound to say further that with mercurialized serum my results have been superior to those obtained by salvarsanized serum. The disadvantage of the former is the pain to which its injection frequently gives rise, apart from the scientific objection that its constitution is not the ideal one for the purpose. The profession still awaits the introduction of a soluble form of mercury which can be administered via the spinal route with a minimum of disturbance and a maximum of efficaciousness. In my opinion such a preparation will prove superior to any form of arsenic.

In judging of the value of any particular form of treatment the clinician must never forget to discriminate between transient and permanent symptoms, as already hinted. A patient with spastic paraplegia from syphilitic meningo-myelitis may under treatment have his serum and fluid tests changed from positive to negative and still be handicapped by his spasticity. Lateral sclerosis once established will persist, as far as we know at present—a cicatrix of dead tissue in the spinal cord. It is obviously unfair to decry special treatment though the results of the disease remain; as well might we refuse to consider removal of a spinal tumour a success because its pressure has caused a degeneration which no surgeon can alter. The moral, of course, is abundantly plain: the earlier and more intensive the treatment in any form of neuro-syphilis the more hopeful is the prognosis.

This question of structural changes calls for more consideration than I am able to give it within the limits of this paper. I may in conclusion, however, be allowed to say that the treatment of gummata in the nervous system is something quite special. In brain or cord a gumma is to all intents and purposes a foreign body, a tumour. Antisyphilitic remedies affect its structure so little as to be valueless. Where localizing symptoms have pointed to a circumscribed gumma, say meningo-cortical, I have always counselled its removal by surgical means, and some of the most striking cases I have had of success in cerebral tumours have been in those whose tumour has proved to be a gumma. In the spinal cord, similarly, if one could only be sure clinically that the symptoms of transverse lesion were referable to a gumma and not merely to a meningo-myelitic infiltration or softening, I should unhesitatingly advise operation.

THE TREATMENT OF NEURO-SYPHILIS, WITH SPECIAL REFERENCE TO THE CHANGES IN THE CEREBRO-SPINAL FLUID.

BY

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In the course of an investigation into the etiology and treatment of disseminated sclerosis on behalf of the Medical Research Council it was decided to investigate by way of control a wide series of cases of various nervous diseases with special reference to neuro-syphilis. The work has been done in collaboration with Dr. Ernest M. Dunlop and Dr. Wilfrid Scott, the pathological portion of the investigation being carried out in the pathological laboratories of the University and Western Infirmary of Glasgow.

Cases of neuro-syphilis which may be grouped as follows have been subjected to investigation and antispecific treatment: tabes dorsalis, tabo-paresis, general paralysis of the

insane, Erb's syphilitic spinal sclerosis, motor neurone disease, and meningo-vascular syphilis. It must, however, be observed that such a classification is based on purely anatomical and clinical considerations, and that modern research tends to emphasize that all possess the same basis—namely, a pathological condition of the nervous tissue or its coverings due to the presence of the *Spirochaeta pallida*. The point of attack presumably is determined by other factors.

It is of interest that in 12 out of a total of 17 cases of syphilitic spinal sclerosis, the diagnosis depending upon clinical indications of involvement of the motor tracts associated with a positive Wassermann reaction in either the blood or cerebro-spinal fluid or both, the cell count was within normal limits—that is, these cases did not show the pleocytosis which is so constant in neuro-syphilis. In this respect the cerebro-spinal fluid picture approximates more closely to that found in disseminated sclerosis, a disease which syphilitic spinal sclerosis may so closely simulate that the differential diagnosis in some cases depends solely upon the Wassermann reaction unless the coexistence of the two diseases be conceded.

With regard to treatment, as we are dealing with an active spirochaetosis, there is the strongest possible indication for the administration of antisyphilitic drugs. It is therefore logical to consider the following questions: (1) Do the therapeutic substances administered reach the infective focus? (2) Is the administration of such drugs attended by risk or ill result? (3) Does serological improvement follow? (4) Is clinical improvement obtained?

As regards the first question, although the results of various observers have been contradictory, there is a certain amount of evidence that arsenic does reach the infective focus, though whether in a sufficient degree of concentration is not altogether clear. Hall, Callender, and Holmblad[1] state that arsphenamin given intravenously in 0.6 gram doses may be detected in 25 to 35 per cent. of the cases. More recently Mehrtens and MacArthur[2] have demonstrated that when spinal drainage by means of lumbar puncture follows the intravenous administration of arsphenamin there is no increase of arsenic penetration, though they report a high rise in positive results when meningeal irritation by means of an intraspinal injection of the patient's own serum has previously been carried out. Corbus, O'Conor, Lincoln, and Gardner[3] claim that the amount of arsenic entering the cerebro-spinal fluid is increased by the previous intravenous administration of hypertonic saline solution, and after this procedure they found arsenic in the cerebro-spinal fluid in 93 per cent. of cases, the amount varying from a trace to 0.01 mg. per cubic centimetre. It has also been shown by Osborne[4] and other workers that iodine can be detected in the cerebro-spinal fluid following on the administration of iodides, and there is evidence to show that the amount so found is greater when the salt has been given intravenously than is the case after oral administration. These facts are of prime importance, as they prove that the chief therapeutic agents do penetrate into the cerebro-spinal fluid, a fact which has frequently been denied.

Along with Dr. Browning and Miss Gulbransen an attempt was made to demonstrate the presence of therapeutically active arsenic in the cerebro-spinal fluid by the following means: The patient received 0.6 gram novarsenobenzol intravenously, the cerebro-spinal fluid was drawn off twenty-four hours later, a mixture of the fluid with blood containing active *Trypanosoma brucei* was incubated for from ten to twenty minutes and then injected into mice. No definite retardation of the resulting infection could be determined even when the animal received subsequently a further injection of the fluid when the trypanosomes appeared in the blood. Of course, this negative result cannot be interpreted as excluding the possibility that in the patient arsenic reaches the central nervous system in a form and amount adequate to produce chemiotherapeutic effect.

In the second place, as regards possible risk or ill result, in the course of this investigation upwards of 2,000 injections of novarsenobenzol have been administered to about 200 cases. No fatal case has been recorded: in two instances mild jaundice developed after the salvarsan administration, but it has to be noted that two similar cases of jaundice occurred in two patients suffering from neuro-syphilis before any salvarsan treatment had been given. In two cases slight arsenical dermatitis occurred; these cleared up immediately following the administration of intramine. The so-called Herxheimer-Jarisch phenomenon has never been observed in this series. In the past its importance appears to have been exaggerated, and it seems probable that a previous course of mercury and iodide will prevent its onset. Numerous cases showing slight optic atrophy have been subjected to intensive treatment and no ill effect noted on subsequent examinations. Optic atrophy is still regarded by some as a contraindication to the administration of salvarsan. This is apparently due to the fact that the administration of atoxyl, which represents a stage in the synthesis of drugs of the salvarsan group, led to a number of cases of permanent blindness. As Browning[5] has recently stated, the chemical side of the relationship between the two substances is of about the same degree of closeness as that of alcohol to sugar. In no case treated in this series has ill effect been recorded, and in no case has any result been obtained to justify the opinion that the treatment of neuro-syphilis is in any way more dangerous than that of primary syphilis.

As regards the question of serological improvement, the results obtained in the treatment of fully established cases of neuro-syphilis show a constant and progressive fall in the cell count until this reaches normal limits, almost constant modification of the colloidal gold reaction in the direction of a negative result, and, in occasional cases, a change in the Wassermann reaction from positive to negative. As examples of this the following observations are tabulated below:

Case 70.—J. G., aged 31, contracted syphilis in 1906. Treated with mercury for six months. Condition on May 17th, 1920: Pupils unequal and did not react, complete left third nerve paralysis, paralysis of right external rectus. K.J. ++, no ankle clonus, plantar reflexes flexor.

Date.	Blood: Wassermann Reaction.	Cerebro-spinal Fluid.			
		W.R.	Cells.	Protein.	Colloidal Gold.
May 17, 1920	Suspicious	Positive	42	Excessive	113333210000
Sept. 29, 1920	Positive	Positive	7	Normal	1111100000
Oct. 30, 1920	—	Positive	2	Normal	1111000000
Dec. 5, 1920	Suspicious	Negative	3	Normal	1111000000

Case 22.—J. McI. Tabes dorsalis. Argyll Robertson pupils, optic atrophy, absent knee-jerks. Rombergism and ataxia.

Date.	Blood: Wassermann Reaction.	Cerebro spinal Fluid.			
		W.R.	Cells.	Protein.	Colloidal Gold.
Mar. 19, 1920	Weak positive	Positive	44	Excessive	555511331000
May 25, 1920	Negative	—	—	—	—
July 20, 1920	Negative	Positive	70	Excessive	12444200000
Oct. 29, 1920	—	Positive	11	Normal	233333 1000
Jan. 28, 1921	Negative	Positive	6	Normal	23321000000
Dec. 14, 1921	Negative	Unsatisfactory	—	—	—
April 26, 1922	Negative	Negative	0	Normal	22110000000

Case 72.—S. M. Neuro-syphilis. Admitted May 20th, 1920, complaining of loss of power in both legs and incontinence of bladder and bowels of eight months' duration. Pupils reacted sluggishly to light. Exophthalmos, slight nystagmus, fundi apparently normal. Slight intention tremor, abdominal reflexes absent, both legs spastic with loss of power. Tendon reflexes of legs ++. Ankle clonus, plantar reflexes extensor.

Date.	Blood: Wassermann Reaction.	Cerebro-spinal Fluid.			
		W.R.	Cells.	Protein.	Colloidal Gold.
May 20, 1920	Positive	Positive	100	Normal	22442110000
Oct. 2, 1920	Positive	Negative	30	Normal	01221000000
Nov. 20, 1920	Weak positive	Negative	3	Normal	32221100000
Feb. 5, 1921	Weak positive	Negative	4	Normal	01110000000

As regards the clinical improvement obtained in the treatment of established cases of neuro-syphilis it must be borne in mind that nervous tissue has minimal power of regeneration and consequently, once definite damage has been done, return to normal function is impossible, though, even in such cases, treatment may arrest the further progress of the

disease at the stage at which it is first encountered. In the cases treated in this series improvement as regards gait, bladder control, lightning pains, and general health has repeatedly been observed, though the lapse of time is not yet sufficient to warrant the conclusion that the disease has been arrested. The whole hope of the successful treatment of tabes and other forms of neuro-syphilis lies in early diagnosis. If the disease can be recognized in the stage of symptoms rather than that of signs a return to normal function may be hoped for, a symptom being regarded as a manifestation of disordered function having no underlying structural change of an irreversible kind. During the progress of this investigation special attention has been devoted to cases presenting symptoms suggestive of early involvement of the nervous system in syphilis. The following case is an example of this :

W. C., aged 24, reported to Dr. Brownlow Riddell at the Glasgow Eye Infirmary on November 22nd, 1921, complaining of double vision which had originated the previous day. Dr. Riddell reported that the diplopia was apparently due to paresis of the right superior rectus muscle. On the 24th there was definite involvement of the right external rectus with crossed diplopia, and no longer double vision in the upper part of the field. On November 30th the eye symptoms had completely cleared up, and a thorough clinical examination of his nervous system revealed no abnormality whatever.

The serological findings in this case were: Wassermann reaction of blood, positive; cerebro-spinal fluid: Wassermann reaction, negative; cells, 3 per cubic millimetre; protein content not increased; colloidal gold reaction, 44443311000.

It is desired to emphasize that in this case transient diplopia was at the time the only clinical evidence of nervous disease, but that as the result of serological investigation a definite diagnosis was established at a stage when cure by treatment might be hoped for.

The symptomatology of onset of these diseases is frequently disregarded or cautiously interpreted, but the correlation of such symptomatology with definitely altered serological reactions may enable the early diagnosis of diseases of the nervous system to be placed on a much more definite etiological basis, and therefore open the way for vigorous specific treatment at a stage at which complete recovery of function is possible.

Technique of Treatment.

The routine adopted in the series of cases here referred to has been a preliminary course of mercury and iodide for an average of two weeks, followed by a series of from twenty to forty injections of 0.45 to 0.6 gram novarsenobenzol given at seven-day intervals. After every fourth injection two weeks' rest was given. Prior to each injection there was no elaborate preparation with starvation, the only departure from the ordinary routine being a saline aperient and slight curtailment of breakfast on the morning of the injection. In addition, mercurial inunction according to the Aachen methods was carried out and intramuscular injections of intramine in 5 c.cm. doses were given at monthly intervals. Perhaps to the latter fact the freedom from ill result may be in part attributed, and in some cases the intramine appeared to intensify the serological improvement obtained. Recently the effect of more frequent administration of smaller doses of novarsenobenzol has been tried in view of statements regarding the rapid excretion of arsenic from the cerebro-spinal fluid, but no statement can be made regarding the special effects of this procedure.

No intrathecal therapy has been attempted, and silver salvarsan has not been employed.

Tabes and other forms of neuro-syphilis have been recognized as clinical entities for generations and we have inherited a wealth of information from the older writers in days when modern serology and bacteriology were unknown and the causal organism unsuspected. All such writers emphasize the necessity of a well-ordered life, the abstinence from stress and strain, and above all the protection from injury in the treatment of these cases. Spontaneous arrest, presumably due to the fact that the syphilitic infection has "burned itself out," may and often does occur, and it is not improbable that the chief factor in its production is the ordering of life along the smoothest possible channels. Under such conditions *vis medicatrix naturae*, on which all healing ultimately depends, may result in arrest, but with our later knowledge of the infecting organism and of the specificity of the salvarsan molecule for the *Spirochaeta pallida* the application of these modern methods may, and in many cases does, supply the help that is needed in the struggle of the tissues with the infecting organism and so shift the balance in the patient's favour.

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THE WASSERMANN REACTION IN THE DIAGNOSIS AND CONTROL OF TREATMENT OF NEURO-SYPHILIS.*

BY

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THERE has been an opportunity recently in this department of testing the Wassermann reaction of the bloods and cerebro-spinal fluids of a considerable number of cases of neuro-syphilis and other nervous diseases, and the results of these tests are summarized in the present communication.

In addition to the examinations that have been carried out in conjunction with Dr. Douglas K. Adams two further series of tests, made during the same period, are included in this summary. The first of these represents the bloods from probable or suspected cases of tabes dorsalis and general paralysis of the insane and all cerebro-spinal fluids which have been submitted from the wards or out-patient department for Wassermann test. The second series consists of examinations of the cerebro-spinal fluid of 94 cases of clinical syphilis attending the Venereal Diseases Centre, who had already received energetic antisyphilitic treatment and the Wassermann reaction of whose blood was no longer positive.

In all cases the method of testing the Wassermann reaction has been as detailed by Browning and Watson,[1] and the criterion of positivity adopted that of Browning and Kennaway,[2] who emphasize the distinction between a diagnostic and a therapeutic positive in the interpretation of results.

For purposes of classification the cases may be divided into:

A. Tabes dorsalis, or suspected tabes.

B. General paralysis of the insane, or suspected general paralysis of the insane.

C. Miscellaneous, presenting a variety of clinical pictures.

In this last group are included the cases with clinical manifestations of disseminated sclerosis in whom a positive Wassermann reaction was obtained in the blood, cerebro-spinal fluid, or both, and which are referred to by Dr. Adams as syphilitic spinal sclerosis.

(A) *Wassermann Reaction in Tabes Dorsalis (107 Cases).*

Specimen.	No. of Cases.	Wassermann Reaction.			Negative Results.
		Positive.	Suspicious.	Negative.	
Blood	99	66	3	30*	30%
C.S.F. ...	70	48	1	21	30%
Blood and C.S.F.	62	35 (in both) 8 (blood only) 8 (C.S.F. only)	1† (C.S.F. only)	10 (in both)	16%

* Two of these cases developed a positive reaction during the course of treatment.

† One of the two cases whose blood Wassermann reaction became positive during treatment.

In the series in which both blood and cerebro-spinal fluid were examined a positive reaction was obtained in one or both in 51 of the 62 cases (that is, in 82 per cent.), while in only 10 of the cases was it negative in both (16 per cent.). It will be noted also that at the original test in one of the cases the cerebro-spinal fluid gave a suspicious reaction and the blood a negative. During treatment, however, this blood was examined twice again, when the results were (*a*) suspicious and (*b*) weak positive. Of interest, too, is the fact that, but for the examination of the cerebro-spinal fluid, a positive reaction would have been missed in 8 of these patients, a point to which attention has already been drawn by numerous observers.

* From the Pathological Department of the University and Western Infirmary of Glasgow. This work was done with the support of the Medical Research Council.

(B) *Wassermann Reaction in General Paralysis (22 Cases).*

Specimen.	No. of Cases.	Wassermann Reaction.		Negative Results.
		Positive.	Negative.	
Blood	19	12	7	37%
C.S.F.	12	10	2	17%
Blood and C.S.F.	9	7 (in both)	2 (in both)	22%

From the clinical data furnished with these cases it would appear that in several instances the Wassermann reaction was tested, not to confirm a diagnosis of general paralysis of the insane, but rather in order to rule it out of count.

(C) *Wassermann Reaction of Cerebro-spinal Fluid in Miscellaneous Cases (330).*

In this series the great majority of the cases presented signs or symptoms of nervous disturbance, but, by way of control, a number were included whose disabilities fell under such headings as: uraemia, pernicious anaemia, diabetes, gastritis, aneurysm, myxoedema, valvular disease of the heart, trench-feet, intermittent hydrarthrosis, rheumatism, carcinoma of stomach, arterio-sclerosis, enlarged prostate, spondylitis deformans.

Among the nervous cases the following conditions were represented: disseminated sclerosis, amyotrophic lateral sclerosis, epilepsy, paraplegia (spastic and ataxic), coma or lethargy, tumour (brain), optic atrophy, diplopia, myelitis, various pareses, hemiplegia, Raynaud's disease, insomnia with choreic movements, Parkinson's disease, delusional insanity, mental deficiency, meningitis, exophthalmic goitre.

The Wassermann reaction was positive in 46 of the 330 cerebro-spinal fluids tested, and, excluding 6 whose clinical summaries have not been traced, the disabilities of these patients were as follows:

	No. of Cases.
Spinal sclerosis	23
Meningo-vascular syphilis	4
Hemiplegia (*a*)...	2
Cerebro-spinal syphilis	1
Argyll Robertson pupil and headache (*b*) ...	1
Argyll Robertson pupil and nephritis (*b*) ...	1
Epilepsy	1
Lethargy (*c*)	1
Exophthalmic goitre	1
Anasarca (*d*)	1
Meningitis or meningismus (*e*)...	2
Functional (?)	2

(*a*) Wassermann reaction of the bloods also positive.

(*b*) In these two cases further indications of disorder of the nervous system are lacking in the available clinical summaries. In each case the Wassermann reaction of the blood was positive.

(*c*) Patient, a boy, aged 16, whose intelligence was low and who, for a year, had been lethargic during the daytime.

(*d*) Patient, an engine-driver, aged 52; no abnormality found clinically in the urine or in the fundi oculorum. Temperature normal. Leucocytes 22,500 per cubic millimetre. Wassermann reaction of blood negative.

(*e*) In these two cases further tests were not obtainable. In each the Wassermann reaction of the cerebro-spinal fluid was weakly positive.

In 24 of the above cases the Wassermann reaction of the blood was tested also and in 7 of these it was negative. (In the tabes series similar differences in the reactions have been already noted.)

Wassermann Reaction in Cerebro-spinal Fluid of 94 Cases of Treated Syphilis.

In the examination of the Wassermann reaction of the cerebro-spinal fluids of 94 cases of treated syphilis from the Venereal Diseases Centre whose blood Wassermann reaction was no longer positive, the following results were obtained: Wassermann reaction of cerebro-spinal fluid: positive 6, negative 88. Of the six positive cases only one had recognized signs or symptoms of nervous disability (hemiplegia), and in these cases antisyphilitic treatment had been commenced as follows:

In the primary stage	2
While on service (? primary)	1
In the tertiary stage (hemiplegic referred to above)	1
On account of positive Wassermann reaction in blood	1
On account of miscarriages (Wassermann reaction in blood originally positive)	1

Of the 88 negative cases 6 presented evidence of nervous disturbance. In three of these, however, this amounted only to headache; in one to headache and failing vision; in one to dizziness; while in the last there were definite signs of bulbar involvement. Treatment had been commenced in these cases as follows:

Primary stage	17
Secondary stage	31
Tertiary stage	19
Nervous	1
On account of a positive Wassermann reaction in blood	7
While on service (? primary)	5
Cases in which the clinical summaries at the beginning of treatment were not available ...	8

The majority, if not actually all, of the cases who received treatment on account of a positive Wassermann reaction in the blood had had their bloods examined as a result of syphilis in their consorts or their children.

Therapeutic Effect on Wassermann Reaction in Neuro-syphilis.

The Wassermann reaction of the cerebro-spinal fluid has been followed during the course of treatment in 26 cases of neuro-syphilis, and in 5 of these a modification of the reaction has been noted. In two of these, cases of tabes, the reaction in the cerebro-spinal fluid, originally repeatedly positive, became negative after seven months' treatment in one instance and after twenty-four months in the other. The remaining three cases were diagnosed syphilitic spinal sclerosis, and in two of these the Wassermann reaction of the cerebro-spinal fluid changed from positive to negative after four and four and a half months' treatment respectively. In the last case, also positive originally, a suspicious reaction only was obtained at the end of four months' treatment.

In the case of the blood the Wassermann reaction has been studied in a series of 23 cases of neuro-syphilis undergoing treatment, and, in addition to the two "provoked" reactions referred to previously, a modification has been noted in six of these. In one, a case of syphilitic spinal sclerosis, the reaction changed from positive to negative after four months' treatment. The remaining five cases were suffering from tabes, and in four of these the reaction altered from positive to negative after from two and a half to eleven months' treatment. In the last it changed from positive to suspicious after eleven months.

In the other 21 cerebro-spinal fluids and 16 bloods no modification occurred in the course of observations lasting over periods of from four to nineteen months.

"Provoked" Type of Wassermann Reaction.

In two instances referred to above, both clinically cases of tabes, the Wassermann reaction of the blood, originally negative, became positive after the commencement of treatment. In one of these the change occurred within a week of the first intravenous dose of novarsenobillon, while in the second a definitely positive reaction was not noted until five months later. The first corresponds to the so-called "provoked" positive reaction, of which one similar case has come to the notice of the author in a series of 36 treated syphilitics attending the Venereal Diseases Centre. The second is of the type described by Strickler, Munson, and Sidlick,[3] who indicated that out of 24 dermatological cases examined by them whose blood Wassermann reaction was negative and who were almost certainly non-syphilitic, a large number, 66 per cent., developed a positive reaction at some period during the course of an experimental intravenous arsenical treatment, arsphenamin being the compound employed. In view of the importance of this observation, could it be confirmed, it was arranged to carry out regular examinations of the Wassermann reaction of the blood in a series of patients, free from serological evidence of syphilitic infection, who were having weekly doses of novarsenobillon, 0.6 gram, intravenously. Ten such cases were investigated, and the number of examinations in each ranged from four to seven:

7 weekly tests	3 cases.
6 ,, ,, ...	2 ,,
5 ,, ,, ...	3 ,,
4 ,, ,, ...	2 ,,

In every case a sample of blood for a Wassermann test was withdrawn immediately before the administration of the dose of novarsenobillon, and the first specimen of blood was taken before any intravenous arsenical treatment had been given.

In only one of the ten cases—one already noted—was any marked change in the Wassermann reaction obtained. In this case—clinically tabes—the reaction became positive after the first injection, and it remained so during the following two and a half months, when regular Wassermann tests of his blood were being carried out. In one other case, clinically suggestive of tabes, a doubtful negative reaction occurred during the eighth and ninth weeks after treatment commenced. The results before and after this period were uniformly negative.

In addition, one of those in the laboratory here, whose serum has been used frequently as the negative control for the Wassermann tests, had three injections of novarsenobillon (0.3, 0.45, 0.45 gram) administered intravenously, at weekly intervals, during August last. The Wassermann reaction of his blood immediately before the first dose, and at weekly intervals for four weeks thereafter, was tested, and on all of these occasions it was uniformly negative.

In view of these findings it would appear that there is no evidence of the intravenous administration of novarsenobillon being associated in any way with the development of a positive Wassermann reaction in the blood, in the absence of definite syphilitic infection.

Conclusions.

1. Serological cure, not only in the blood, but also in the cerebro-spinal fluid, can be effected in a sufficiently promising number of cases to warrant energetic use and further improvement of the methods at present utilized in the treatment of neuro-syphilis.

2. It is very desirable, as has been emphasized by numerous workers, that in the routine treatment of syphilis and in the clinical investigation of nervous disease the cerebro-spinal fluid should be examined in every case and its Wassermann reaction tested.

3. There is no evidence of a positive Wassermann reaction being provoked in a non-syphilitic patient as a result of the intravenous administration of novarsenobillon.

To Professor C. H. Browning for the favour of his opinion in the interpretation of many of the Wassermann results, and for much helpful advice, to Dr. Douglas K. Adams for his co-operation throughout the investigation, and to Drs. W. R. Snodgrass and J. McGregor Robertson of the Venereal Diseases Centre for their willing assistance in providing clinical material and in furnishing data concerning their cases, it is a pleasure for the author to have the opportunity of recording his indebtedness.

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DISCUSSION.

Dr. ALDREN TURNER (London) said that he would give a summary of the results of treatment of neuro-syphilis by modern methods from a number of cases treated at the National Hospital, Queen Square, London, which had been submitted to analysis by Dr. Macbride and himself. About two hundred cases of different forms of neuro-syphilis had been so treated and the results could be grouped as follows: The first group of about 10 per cent. of all cases, including tabes dorsalis, usually of long standing, in which the clinical picture of the disease was characterized by subjective and objective sensory symptoms, loss of the deep reflexes, ataxia, optic atrophy, etc., but in which the Wassermann reaction of the blood and cerebro-spinal fluid was negative and the cell count was within normal limits. These appeared to be cases in which the activity of the morbid process had abated either spontaneously or in consequence of previous treatment. There was difficulty in determining whether these were cases of arrested tabes, as it was not uncommon to find the occasional recurrence of symptoms, such as pains, crises, or bladder trouble, which were amenable to a further course of treatment. It was not always possible to obtain trustworthy evidence of previous treatment, but the course of the malady and the serological tests favoured the belief that the activity of the disease at all events had subsided.

The second group contained about 75 per cent. of all cases, including general paralysis, tabo-paralysis, and tabes dorsalis, in all of which the symptoms and signs were characteristic, the Wassermann reaction was strongly positive in both serum and fluid, and the lymphocyte count was high. The cases of general paralysis and of tabo-paralysis in this category were of recent origin and gave a history of progressive development. In the tabetics the duration of the disease was about five years. With the exception of some temporary relief of the subjective sensory symptoms and a reduction in the lymphocyte count, no material improvement resulted from treatment. A few cases appeared to progress in spite of it. The positive quality of the Wassermann reaction in blood and fluid remained unaltered. This formed by far the largest group of paretics and tabetics seen in hospital practice, and their analysis showed that there was much scope for further improvement in means and methods of treatment in a large percentage of such cases.

The third group comprised about 12 per cent. of the cases, including tabes dorsalis of short duration (from two or three months to two or three years) occurring in relatively young persons with typical subjective and objective symptoms, positive Wassermann reactions in serum and fluid, and a high cell count. As a direct and immediate consequence of treatment, the Wassermann reaction became negative or weakly positive, the cell count fell below 10, the subjective sensory symptoms—pains, paraesthesia, etc.—abated, and the general health improved. From the therapeutic standpoint that was an important group, as there was every reason to believe that it might be possible to arrest the progress of some cases of tabes in the early stages by appropriate treatment under certain conditions. As far as could be ascertained at present those conditions are: the commencement of treatment within, if possible, a few months of the onset of the symptoms, persistent treatment over a sufficiently long period, and a repetition of treatment at intervals with periodic serological tests. It was not improbable in those cases that the morbid process primarily attacked the spinal meninges rather than the nervous parenchyma and that by early and vigorous treatment secondary degeneration in the posterior column might be averted.

In the fourth or meningo-vascular group, which included the so-called syphilitic myelitis, meningo-myelitis, and spastic paraplegia, the Wassermann reaction varied considerably, and early treatment might be beneficial. It was, however, important to bear in mind when studying neuro-syphilis and the influence of treatment upon it that the effects of damage already done to the nervous parenchyma remained permanently.

Dr. HENRY J. MACBRIDE (London) said: My contribution to this discussion will consist of observations (1) on changes in Lange's colloidal gold reaction as a result of treatment, and (2) on methods of treatment. The Lange reaction, as we all know, holds a prominent place in the routine examination of the cerebro-spinal fluid, and is a very valuable confirmatory test for syphilis of the nervous system. Lange claimed for his reaction close parallelism with the clinical course of syphilitic disease of the central nervous system, and this claim Vogel and others have supported. Let us consider how far it is justifiable. Before making an analysis of cases we must decide what is a negative and what is a positive reaction. It is agreed by practically every observer that it is quite impossible to obtain for every test colloidal gold solutions presenting the same precipitating power. To add to this difficulty in technique many other pathological conditions may give a curve. Disseminated sclerosis may give even a paretic curve, and from our figures at the National Hospital 9 out of 81 cases gave this type of curve. It is also possible to obtain low curves in fluids from normal people. It is evident, then, that the curve must be marked before it can be considered positive. At the National Hospital a positive curve is one in which there is a discoloration to the extent of "3" in at least two tubes.

Of 100 tabetics whose cerebro-spinal fluid was examined on admission the Lange reaction presented the following results: 35 poor or negative curve; 30 minimal curve; 21 good curve in zone II; 14 paretic curve. Here were 100 cases sufficiently well established to enable the clinical diagnosis to be made and, in fact, for the most part sent into hospital because their symptoms were progressive, yet in 65 Lange's reaction was either negative or indefinite. It can hardly be said, then, that it corresponds with the patient's clinical condition. Furthermore, if the patient's condition improves, no corresponding improvement in the Lange reaction is possible.

I have analysed another series of 35 cases of tabes, taboparesis, general paralysis of the insane, and cerebral syphilis, in which the Lange reaction was observed before and after treatment, and the following are the results. The cases fall

into three groups: (1) those which show a diminution or flattening of the curve; (2) those which show no change in the curve; and (3) those in which the curve became more pronounced.

Group 1.—The cases which showed a diminution of the curve were 14 in number, and of these 13 showed corresponding clinical improvement. Five began with paretic curves which became reduced to low luetic curves. Of these, one was a general paralysis of the insane, treated with intrathecal mercurialized serum on whose cerebro spinal fluid five observations were made. The curve became smaller at each successive examination, although the Wassermann reaction remained strongly positive throughout. Another was a case of tabes treated with mercurialized serum and whose cerebro-spinal fluid was examined eight times. In the second, third, and fourth examinations the curve in zone I was practically negligible; but in the fifth and seventh examinations the curve again became paretic, to disappear once more in the eighth examination. There were no clinical regressions to correspond with the reappearance of the paretic curve. In this case again the Wassermann reaction remained strongly positive throughout. There was one case among the 14 of Group 1 in which the intensity of the reaction diminished and in which no clinical change could be seen.

Group 2.—The cases which showed no change in the curve numbered 15. Six had paretic, or, in other words, maximal curves, which did not alter, and the condition of the patient remained the same or got worse. These were 5 cases of general paralysis of the insane and 1 of tabo-paresis. Nine had negligible curves which showed no alteration after treatment. Clinically these patients showed some improvement. In 3 of these 9 cases the Wassermann reaction was negative in the cerebro-spinal fluid but positive in the blood.

Group 3.—The cases in which the curve became greater after treatment numbered 6. Five of these improved clinically, while one remained clinically unchanged.

Altogether in the three groups 16 cases out of the 35 showed no change in the Lange curve corresponding to the clinical symptoms, and in 6 of these the curve actually increased while there was clinically improvement. From these two series I feel justified in concluding, therefore, that there is no consistent parallelism between the changes in the Lange curve and those in clinical symptoms. The Wassermann reaction, though less sensitive than the Lange, is a more reliable guide to the clinical progress of the disease. At the same time a positive Lange reaction is a valuable confirmatory test, but a negative or indefinite curve has not the same significance. I cannot say how far a positive curve is an indication for further treatment.

Methods of Treatment.

When a patient is admitted to the National Hospital his cerebro-spinal fluid and blood are taken for examination. He then starts on a course of iodide, mercury, and generally intravenous novarsenobenzol. Iodide is started in 10-grain doses and worked up slowly to 25 or 30 grains thrice daily. The mercury is given by inunction, 1 drachm of unguentum hydrarg. daily. With regard to the novarsenobenzol, we begin with very small doses, usually 0.15 gram, and increase through strengths of 0.3 and 0.45 to 0.6 gram, which is the maximum we now give. For occasional cases we give intrathecal injections either of mercurialized serum or of patient's own serum, prepared after two or three doses of novarsenobenzol. With this we combine re-education, massage, rest, and such symptomatic treatment as special cases may require. During the last year over 1,000 injections of novarsenobenzol were given, without precautions in reference to meals and without any accompanying dose of glucose. In no case was there any jaundice. Dermatitis occurred in three cases all at the same time, and was believed to be due to a faulty lot of novarsenobenzol. Sickness was a very rare occurrence. I have said that we generally give novarsenobenzol, but there is one very important exception to this—if there is any sign of optic atrophy. Four cases have come before my notice in which arsenical preparations increased an early optic atrophy. In one of these, a juvenile tabes, the eyesight was fairly good beforehand, but in all probability early optic atrophy was present. Before the patient came under our charge he was treated with an intravenous injection of some arsenical preparation, and the first dose caused complete blindness. It is the opinion of those well qualified to judge that cases of early optic atrophy should be treated very carefully. Arsenic should be avoided if possible and the treatment confined to mercury and iodides.

Dr. A. STANLEY BARNES (Birmingham) remarked that the results of the salvarsan treatment were a little better, but not much better, than those obtained in the old days with mercury alone; in 10 per cent. of all cases the disease tended to die out whether treated or not. The aim should be to find some drug which would percolate more easily. He suggested protein shock in addition to mercury and arsenic injections, in the hope of aiding the percolation of these drugs into the cerebro-spinal fluid.

Sir FREDERICK MOTT doubted if there was much evidence that the arsenical treatment was much better than mercury inunction, and therefore prophylactic treatment—the prevention of the entrance of the organism—was of the greatest importance. In 66 per cent. of fatal cases of general paralysis of the insane organisms could be found in the substance of the brain and in the perivascular spaces; they were found especially easily in four cases treated by intrathecal injection. Mercurial treatment was extremely valuable and inunction the best way of giving it. He referred to the simple and effective Sicard method which gave small doses on alternate days of novarsenobenzol hypodermically or intramuscularly in glucose.

Professor C. H. BROWNING (Glasgow) considered that no satisfactory experimental evidence had yet been offered of the existence of a neurotropic variety of spirochaete. The problem of therapy in nervous disease was very difficult; all cases attending a venereal clinic should be examined as to their nervous system to determine at what stage neuro-syphilis arises.

Dr. DAVID LEES (Edinburgh) spoke from an experience of 3,000 to 4,000 cases of early syphilis in which he had tried all methods of treatment previously mentioned except that by intracranial injection. He was not satisfied that any better results were obtained by spinal drainage than by the Sicard method, but in eight of nine cases of tabes in which Quéry's monkey serum was used intramuscularly very definite improvement followed.

The PRESIDENT (Professor G. M. Robertson, Edinburgh) outlined the development of our knowledge of general paralysis of the insane, and moved the following resolution: "The members of the Section of Neurology and Psychological Medicine of the British Medical Association send their congratulations to the Dean of the Faculty of Medicine of Paris on the occasion of the centenary of the presentation of the thesis by Bayle entitled *Recherches sur les maladies mentales*, in which for the first time the view was expressed that the symptoms of paralysis complicating insanity were those of a distinct disease now known as general paralysis of the insane. The discovery and differentiation of the symptoms of this disease are justly regarded as one of the greatest advances ever made in neurological and psychological medicine and the whole credit of this is due to the observations of Parisian physicians, especially of Esquirol, Roger-Callard, and Calmeil. The members of the Section further desire to express their sense of the great debt they owe to French neurologists and psychiatrists for this and for much other work in their special branch of medicine." The resolution was seconded by Sir Frederick Mott and carried with acclamation.

ON THE ELEMENT OF CONTRAST IN THE PSYCHIC MECHANISM.

BY

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PSYCHOLOGISTS are agreed that the whole mental structure of evolved man rests upon the laws of association of ideas. It has been shown that the great bulk of associations common to all men are capable of being included within two main categories—namely, those founded upon resemblance and those upon contiguity in time and in space.

Some authors have written of these two categories as intrinsic and extrinsic, and others again as internal and external. Various subtypes of associative bonds have been recognized, and amongst these there are some that are individual rather than general—for example, associations between a word and a letter (clang associations), between a letter and the name of a colour, between a number and a colour, etc. No doubt the prevailing type in any particular individual is due in great part to training, education, and

habit—for example, the reasoner as against the descriptive writer; but it also depends upon innate factors—that is to say, factors intrinsic in the developmental potentialities of the neural mechanism. A congenitally blind man cannot associate yellow colour with the word "orange"; the artist and musician perceive shades of colour and qualities of tone and harmony that lie without the perception of others. In this way we have come to recognize differences in the mental make-up of separate individuals, these differences depending upon the prevalence of particular types of associative links in the ideative mechanism. It has been pointed out, for example, that the majority of men are auditory rather than visual, but a considerable number show a prevalence of visual images and associations, whilst others again are decidedly tactomotor.

Amongst the special varieties of associative bonds that can be distinguished there is, however, one which is common to all men, and at the same time so powerful in many that it deserves to be considered in a category by itself. I refer to associations due to contrast.

From the dawn of consciousness in the human infant, from the moment there begins to arise a distinction between the external and the internal, between that which is self and that which is not self, there begins a struggle which is characterized by a contention of elements for and against existence and expansion. In this contention contrasting elements are ever in evidence, and, as experience augments, the opportunities of contrast become ever more subtle and complex. "Man," wrote Dumas, "is a strange animal wholly made up of contrasts." That statement may not carry conviction on the face of it, but a little consideration of the subject will soon convince one that it is in great measure true.

It is noteworthy that, centuries ago, philosophers and psychologists recognized the fact that contrast played an important part in the ideative processes. "When we seek," said Aristotle, "after an idea which is not immediately before us, we reach it through the mediation of another idea, either by resemblance or contrast or contiguity." Yet I have found on consulting a number of modern textbooks of psychology that comparatively little attention is devoted to contrast as an element of any particular importance in the psychic mechanism. Some authors omit this subject entirely, whilst others make only a passing reference to it.

Professor Baldwin,[1] in treating of the laws of association of ideas, admits that at first sight one might be warranted in citing contrast as a distinct principle of association. "If the sight of a dwarf brings up a giant, if sour makes one think of sweet, there can be no doubt," he says, "in such cases of contrast of the reality of the association; but," he asks, "are there not other reasons than that of contrast to which it may be referred?" He answers: "There are such reasons, it seems, in all cases, and we are led to reduce these associations to resemblance and ultimately to contiguity. In most cases of contrast," he argues, "there is a standard of reference to which both the presentation and the revived image are referred; this standard constitutes a point common to both ideas, a point of resemblance. For example, the short man suggests the tall, since both are, at once, thought of in comparison with an average man. The one is short only as he is shorter than usual, and the other is tall only as he is taller than usual. Thus in the very conception of the contrasted images a common element enters. This common element . . . secures the association by contiguity."

The view thus expressed by Baldwin would appear to have been endorsed by many other writers, but, however logical it may appear to be, it does not really invalidate the position of those who would regard contrast as in itself a distinct and fundamental principle of association. It merely brings into prominence the fact that we can distinguish degrees of contrast and, further, that contrasting ideas are brought into contiguity in consciousness by the very reason of their contrasting character. After all, contiguity itself can only be conceived in relation with the conception of separation or remoteness.

The general law would appear to be that the first and last components of a series are more closely associated than the intermediates; in other words, that associations are more prone to be formed between maximal than between minimal contrasts. In the field of the sensations, for example, black is more closely associated with white than with the intermediate shades of grey. Heavy is associated with light, smooth with rough, and so on. In the field of the emotions we have pleasure associated with pain, friendship with enmity, love with hate, whilst in the higher field of the sentiments we have the moral associated with the immoral, cowardice with courage, etc.

It would seem to be the case that it is where thought embraces factors that are attributive—that is to say, qualitative, quantitative, or distinctly affective—that the element of contrast is particularly apt to come into play. Where the more or less purely cognitive factors in thought predominate in consciousness, there is less likelihood of contrasting elements becoming prominent. "Sweet" finds ready association with "sour," "long" with "short," "good" with "evil"; but "horse" is not unlikely to be associated with "stable" or "cart" or "race," "desk" with "office" or "papers," "pen" with "ink," and so on. In the latter examples the affective element is weak and contrast unlikely. So, too, in many ideative processes, such as are involved in the pursuit of scientific problems and reasoning to a logical conclusion, the ideative process may be sustained with a predominance of cognitive factors and a relative absence of contrasting elements. Even under such conditions, however, conditions involving processes of cold calculation or abstract reasoning difficulties may arise. The happy solution of the problem or the attainment of the end in view may, after long and sustained thought, appear no nearer; unforeseen obstacles may arise, steps may have to be retraced, failure may threaten and, with that, discouragement may supervene, bringing in its train numerous contrasting ideas. Apart from that, however, the fact remains that a great part of the everyday mental activity of the generality of men, that part concerned in the things that matter, in the struggle for existence, in the attaining of success, the getting of comfort, in short, in the expansion and development of the individual and social ego, is characterized by strong affective tones of consciousness, which permit the play of contrasting ideas for and against.

Here I would like to dwell for a moment on the part played by the affective or emotional element in thought as an important associative link in the ideative processes, for I am inclined to think that it deserves more attention than has been accorded to it by the majority of writers. I will not attempt to enter into any discussion as to the nature and genesis of emotion—that lies entirely without the immediate scope of this paper. I will simply remind you of the biological law that every stimulus which acts upon a living organism is harmful or beneficial, integrative or disintegrative in its effect upon the organism.

(It may be argued that some stimuli are indifferent in their effects, and in this connexion allusion may be made to modes of natural energy which are constantly impinging upon our bodies, which yet awaken no sensation whatsoever—for example, emanations of radium and the ethereal vibrations of the ultra-violet rays which do not reveal themselves to our unaided senses. Were we to pursue this argument we should have to discuss the distinction between mere reception of energy and sensation and all that is involved in the old problem, "Where does sensation begin?" The study of all that is comprised within the term "kinaesthesis" goes to prove that the biological law referred to is fundamental and permits of no exception; that, indeed, every stimulus which penetrates the organism has an integrative or disintegrative effect, no matter whether it does or does not awaken sensation. One might refer in passing to the varying response of the muscles of the iris to different intensities of light, unaccompanied by sensation yet certainly protective and integrative in its effect.)

Leaving aside the disputed question of indifferent stimuli, one can certainly say that whenever a stimulus penetrates the organism and arouses sensation that sensation has qualities or attributes which can be spoken of as beneficial or harmful, integrative or disintegrative. Similarly all our percepts, which at bottom are complexes of sensations, have their sensational accompaniments which give rise to tones or modes of consciousness to which we ascribe the so-called emotional attribute of pleasure or of pain. When we rise from perception to ideation analysis convinces us that every idea bears with it a mnemonic residuum of the particular sensational and emotional attributes that belong to its perceptive content. This emotional concomitant which attaches to every idea frequently serves as a powerful bond of association in the ideative processes. In illustration one might cite the case of a man to whom an unexpected fortune has come. We say he is overflowing with happiness. His consciousness is occupied with ideas which have as their affective components the emotional element of joy. It is not likely that painful ideas will spontaneously arrest his attention. He

cannot be at once gay and sad. The prevailing bonds of ideative association in this case lie more in the affective than in the cognitive elements. No doubt the usual associative links of similarity and contiguity are each in evidence, but the first importance attaches to the affective elements. The condition is well exemplified in the expansive maniac whose incoherent flight of ideas often lacks any consistent associative bond other than the emotional.

Professor James[2] is found amongst those who emphasize the important part played by the emotional bond in the associative processes. He speaks of it as "emotional congruity" and places it along with habit, recency, and vividness, as affording an explanation why one rather than another of many possible associations should follow a particular stimulus. In this connexion Professor James speaks more particularly of normal mental action, but it is a fact that the influence of emotional congruity upon the mental mechanism is even more striking in cases of mental disorder.

Emotional congruity is but another term for emotional similarity or harmony, and thus it may be brought within the category of the associative bonds founded upon resemblance. At the same time it is worthy of notice that the factor of contrast may come into play here also. It is widely recognized that the same images and objects do not constantly bring into consciousness the same associates. As James has well said, "The records of Arctic or African travels, perused in one mood, awaken no thoughts but those of horror at the malignity of nature; read at another time they suggest only enthusiastic reflections on the indomitable power and pluck of man." Speaking from his own experience he declares that "few novels so overflow with joyous animal spirits as *The Three Guardsmen* of Dumas. Yet it may awaken in the mind of a reader depressed with sea-sickness, a most woful consciousness of the cruelty and carnage of which heroes like Athos, Porthos, and Aramis make themselves guilty."

Similar experiences are doubtless common to all of us, but the contrasted states of consciousness which arise as a result of the same images probably find their explanation in an altered kinaesthetic tone of consciousness. The pleasures of yesterday lie as a pall upon us to-day. At first thoughts one might conclude from such instances that the same ideas have not always the same emotional concomitants inherent in them, but that would be a very wrong conclusion. If at one period of our lives the exploits of the Three Musketeers excite within us enjoyable emotional states and at a subsequent period awaken opposite feelings of repugnance and horror, the emotional contrast finds its true explanation in the fact that on the second perusal a new order of ideas has arisen, these ideas bringing along with them their own peculiar emotional tone. In the example just quoted the repugnance experienced on the second perusal is the natural consequence of ideas of bold bad men who delight in bloodshed and deeds of evil daring. These ideas differ from those that were present in consciousness on the previous occasion.

Expressed in another form, it can truly be said that the same images and objects are not always succeeded in consciousness by the same associates, but that is a very different thing from saying that the same ideas have not always the same emotional concomitants. Again, our ideas of particular objects may alter from time to time as our perceptions of these same objects and their relations become more perfect and complete, so that along with cognitive development there will be emotional variation, always, however, in strict relation with the cognitive variation.

I wish to lay particular emphasis upon the latter point, because not a few authors who have discussed psychological problems in recent times from a psycho-analytical point of view have proffered as explanations of certain morbid states the splitting off of the affective element from a certain order of ideas to which it properly belongs and its transference and attachment to another order of ideas, often of a contrasting nature. Such an explanation (like some other propositions, advanced by certain psycho-analysts) may be plausible, but it does not withstand criticism, nor does it accord with well-established biological principles founded upon the study of the evolution of psychic phenomena.

To my mind the cognitive and affective elements which together compose any particular idea are as inseparable as the heat and the light which we find associated in the glow of an incandescent lamp, which together, and only together, give the incandescence. It is true that the heat and the light may vary with variations in the quantity of energy which is expended, and, again, that the same amount of energy can be made to give variations in heat and light if the disposition of the apparatus is altered and new elements are interposed in the circuit. Similarly, the intensity of the affective and cognitive elements of an idea may vary in consciousness from time to time according to the intensity of the stimulus that has re-evoked it, and according as new elements intervene in the nervous mechanism involved.

What is true of one idea is equally true of trains of thought. The intervention of new elements coincides with perceptive and ideative developments, and with the kinaesthetic variations which underlie and afford the explanation of our variable moods and temperaments. All emotional states are blended with the kinaesthetic waves which arrive at the central nervous system from every organ and tissue, though these do not in normal conditions awaken consciousness.

Contrast provides us with a useful biological distinction between lower and higher forms of consciousness. Professor Bianchi[3] of Naples, in treating of the phenomenon of consciousness, alludes to the difficulty which all psychologists and philosophers have experienced in attempting to define the point in the scale of living organisms where consciousness can be said to be first manifested. He provides, however, a very useful and suggestive contribution to this discussion in his distinction between what he calls lower consciousness and higher consciousness. Higher consciousness, according to Bianchi, is an attribute of all evolved human beings, and it may possibly be ascribed to the higher mammals, which, to the external observer, seem to give evidence of reasoning capacity. The dawn of higher consciousness would coincide with the appearance of contrast between actual images and those furnished by memory of past experience.

"If I prevent my dog," says Bianchi, "from making off with a piece of meat and then go away with forbidding and threatening air, leaving it beside the dog, he refrains from touching it. Such behaviour represents an impulsion resulting from the internal struggle between hunger, desire, the impulse to eat the piece of meat, and the prohibition received. It is conscious behaviour. If desire and hunger gain the upper hand and the dog seizes and eats the piece of meat and then, very repentant and fearful, hides himself or runs a long way off, only to return home after a time full of compunction and humiliation, imagining that he will have to confront his master's displeasure, this is consciousness made up of memories, associations, imagination, and sentiment." It is conscious rather than instinctive behaviour, inasmuch as it involves the recall of past percepts and the contrasting of these in consciousness with the percepts of the moment. We can recognize in such behaviour a play of memory, and a choice from amongst contrasting images—factors which form the basis of discrimination, reasoning, and judgement. It is considerations such as these that induce Bianchi to advance the hypothesis that "whilst consciousness has its nucleus in sensations and organic movements, and doubtless may be fashioned in different manner in different beings, yet evolved consciousness emanates from the *rencontre* of the actual perception or representation with other confirmatory or contrasting percepts furnished by the memory of previous states of consciousness conserved in the unconscious."

The more closely conduct approaches to behaviour which is an immediate outcome of percepts or representations of the moment, the more it presents the character of immediate reaction to a particular stimulus, the more invariable and uniform the memory involved, or, expressed in other terms the more it is the resultant of the flow of nervous energy along habitual and unvarying nervous pathways, the more does it sink to the level of the instinctive. Intelligent behaviour on higher levels results from the intervention of more numerous representations furnished by a memory which is multiform and variable, varying as it does with length and breadth of experience, a memory which permits the play of ideas for and against, with the ultimate ascendancy of some over others, manifested in conduct which represents a more perfect adaptation to circumstances. Here one can conceive the underlying mechanism to involve a flow of energy along more numerous and complex nervous pathways, some convergent in one direction, others divergent or convergent towards an opposite direction, the issue being dependent upon the ultimate surcharge of one rather than another of the different sets of neuron routes involved. In brief, there is herein brought into play all that extensive mechanism which we conceive to underlie all that is included within the terms memory, reflection, discrimination, choice, judgement, reasoning, inhibition, and will.

It is clear that the greater the store of utilizable mental

capital, or, in other words, the more extensive the memory and the more facile the process of recall, the greater will be the opportunity for contrasting elements to come into play, the greater will be the range of adaptability of the individual to his environment, and the greater the probability of success.

There are exceptions to every rule. Instances will occur to your memory of men who have on occasions achieved success without much reflection, where others with greater powers of discrimination, of contrasting the pros and cons have failed. The rash speculator who makes a successful plunge into the stock market will afford a ready example. We commonly declare his success to be due more to good luck than good judgement, and it is not from such examples that we seek to deduce laws that may usefully regulate the conduct of men in general. If, as not infrequently happens, a great store of knowledge does not coincide with highly intelligent conduct, that is probably to be ascribed to a relative paucity of contrasting ideas or a lack of facility in recalling contrasting ideas from the mnemonic capital, always taking into account the influence of habit.

I have already made passing reference to the differences that can be distinguished in different individuals in the formation and expression of ideas according as there is a predominance of auditory, visual, and tactomotor elements in their mental make-up. Differences may likewise be founded upon the relative absence or frequency of contrasting elements. Such differences will depend partly upon qualities intrinsic in the nervous substance, but they are partly to be explained by the law of habit, which here, as in most aspects of the mental mechanism, is of great importance. This fact finds tacit recognition in the upbringing of the infant and the education of the child.

It is probably the case that the dawning consciousness of the infant rests upon vague and confused contrasts between inner and outer relations, between the self and the non-self, between sensations of comfort and discomfort. The child is taught to recognize and distinguish between different objects by having pointed out to it that the one possesses features or qualities which are absent in another and vice versa. Thus occasions permitting contrast are constantly arising. From an early age the child is ever being impressed by parents or instructors to "do" this and "don't do" that, that this is "good" and that is "bad." These injunctions, drawn as they are from the maturer experience of elders, are often beyond the child's philosophy. That they are often in contrast with its natural tendencies is evidenced by the mode in which it receives them, its wonder, and its "whys" and "why nots." Just here lies the great distinction that separates the human being from brute creation.

In his discourse upon reasoning, Professor James has declared that the "characters whose presence impress brutes are very few, being only those which are directly connected with their most instinctive interests. . . . A thing may remind a brute of its similars but not of things to which it is but slightly similar; if the most prosaic of human beings could be transported into his dog's soul, he would be appalled at the utter absence of fancy which there reigns. Thoughts would not be found to call up their similars but only their habitual successors. Sunsets would not suggest heroes' deaths, but supper time. That is why man is the only metaphysical animal. To wonder why the universe should be as it is presupposes the notion of its being different, and a brute who never reduces the actual to fluidity by breaking up its literal sequences in his imagination can never form such a notion. He takes the world simply for granted and never wonders at it at all."

Again, it may be pointed out that a great part of education in early years is based upon the principle of impressing definite ideas upon the child and of encouraging certain habits of thought and conduct rather than others. Such forcible impressions necessarily imply repressions towards thought and action in other directions, although the contrast involved may not be brought prominently before the child's consciousness. Taken as a whole, the pedagogic method or system is logical and good, and is perhaps the only method available as a short cut to the acquisition of the knowledge laboriously acquired by preceding generations. There is a point here, however, which should have great significance to the compilers of scholastic schemes. The forcible application of methods and systems designed for the mass, but not necessarily appropriate to the individual, contains a certain element of danger.

After the child has suffered repressions and inhibitions in the domestic circle, under parental or other authority, he proceeds to the elementary school, where he is submitted to a process of training which is based largely upon the idea of encouraging certain habits of thought and conduct and discouraging others. It very often happens that by the time he has reached the age of 11 or 12 he has lost a great deal of the curiosity and inquisitiveness that characterized his earlier years. He has learned to appreciate the fact that things are not always what they seem to his untutored mind, and at the same time has acquired the habit of accepting from his parents and instructors the explanations which they proffer of the many problems that may come before him, without much discussion. If the father or mother or teacher says so then it is right. He has acquired habits of credulity and obedience, but this unfortunately is at the expense of criticism and discrimination. Contrasting notions, upon which discrimination is largely based, are not encouraged.

All this is no doubt mainly to the good, considering it is true that the system of education that is involved has been compiled, generally speaking, from experience gained by older and wiser individuals. It represents a method of imparting knowledge that is most promising of useful results, but it makes no allowance for individual variations in natural tendencies. Generally speaking, early home and school training does not encourage the habit of criticizing, which largely depends upon ability to bring contrasting notions together in consciousness. Notions, doctrines, and explanations laid down with authority by parents, teachers, or elders are apt to be accepted without much questioning by children. Habits of thought thus early impressed are not readily broken. (Many of us have doubtless had experience of this in the religious teaching which was imposed upon us in our earlier years, about the accuracy or tenability of which we may have come to have some doubts only after the lapse of many years.) Comparatively few are by nature, or rather should I say, by habit and education, intensely critical and penetrating, and many of us experience a kind of shock when beliefs we have cherished are assailed and shown to be untenable.

Apart from matters of faith, our beliefs in matters of fact are greatly influenced by early training, and misoneism of later years no doubt finds its explanation in the difficulty that is experienced in overcoming the resistances which contrasting ideas imply. "Get hold of the children," say those who are interested in the implantation and spread of new principles or doctrines; but whilst we recognize the good that is in the system, we must not shut our eyes to the evil. Socialistic, asocial, and revolutionary doctrines preached constantly with the voice of authority by parents or teachers or elders are certain in a large number of instances to be accepted without much criticism because they have the stamp of authority upon them. Whether they will afterwards be rejected or modified will depend to a large extent upon subsequent environment and experience—that is to say, upon the opportunities occurring in the life of the individual for the play of counter-influences and the formation of contrasting notions.

What I have hitherto said has had reference more particularly to the part played by the element of contrast in the normal mental mechanism, but a little reflection will show that the subject is worthy of further study in relation to many morbid mental phenomena. Speaking generally, one might say that many mental disturbances are associated with deficiency in number or potency of contrasting ideative elements, whilst others show a morbid preponderance of contrasting notions over those other ideas which have been the means of their recall into consciousness.

The contrasting capacity is very limited or absent in idiots, imbeciles, and mental defectives, whose mental life revolves in narrow spheres, characterized by simplicity as well as paucity of ideas. Their defective judgement and discrimination may be explained as largely dependent upon their inability to compare and to contrast. At the other end of the scale dements find themselves very much in the same position either because of their loss of mental capital or their inability to recall from their mnemonic store the requisite confirmatory and contrasting elements which form the basis of sound judgement.

Again, the impulsivity which is so prominent a feature of the epileptic psychosis, as well as of mental deficiency and certain forms of mental enfeeblement, may be interpreted as affording evidence of the lack of contrasting notions. If an idea, having presented itself in consciousness, is immediately translated into action in the rash and precipitate manner so

characteristic of the epileptic, that would signify not only great accessibility and permeability of the motor paths, but also a failure to call forth contrasting ideas with their inhibitory accompaniments. There is here a sort of short-circuiting as compared with what we conceive to occur in processes involving contrast, choice, and volition.

So, too, in many dreams the rapidity and amazing ease with which we fancy notions to be realized under conditions which to our waking consciousness seem incongruous and illogical, may be conceived to be due to a similar short-circuiting, or, in other words, to the non-intervention of all the normal associative mechanism with its representation of confirmatory and contrasting notions and tendencies, which is the feature of the fully conscious state.

Whether we do or do not accept the prevalent notions of the subconscious and the unconscious as set forth by the exponents of the modern psycho-analytic doctrines, we are compelled by the facts of experience to admit different intensities of consciousness even in the waking state. There are times when the thinking process is intensely active, when representations are clear and recall their various confirmatory and contrasting associates with readiness and facility, when ideation is sustained and logical conclusions are arrived at. At other times (associated, it may be, with fatigue or toxaemia) we experience great difficulty in pursuing trains of thought, memory is unfaithful, and even with effort we cannot think clearly, notwithstanding the fact that we are quite awake and conscious.

Again, practically all human beings are more or less given to abstraction. Abstraction, when it takes place with full consciousness, pursuing preconceived ends, furnishes us with examples of inventive imagination. In states of less intense consciousness it gives us reverie and day-dreaming. When we allow our thoughts to wander, as we say, the new formations that arise from unwonted ideative associations are often absurd and illogical. When we regain our normal state of consciousness we recognize them to be fantastical and out of harmony with reality, which furnishes a number of contrasting images. These new formations do not fit in with our preformed notions. They do not become attached to the latter with strong associative bonds and so are readily forgotten, at least in normal man. Yet it should ever be borne in mind that they represent actual psychic new-formations which under appropriate circumstances may be recalled or re-enacted. The requisite conditions may be found in states of low intensity of consciousness—as, for example, in subsequent periods of reverie or in dreams or in conditions of delirium, when something akin to short-circuiting in the psychic mechanism again becomes the rule.

Many automatisms furnish us with examples of mental action which is characterized by absence of psychic contrast. An extreme example is afforded by the somnambulist, who unhesitatingly pursues his course in dangerous positions, quite oblivious of the risk he runs; the feats he unconsciously performs would be beyond his achievement in the waking state, when the situation in which he would find himself would evoke contrasting ideas of risk and danger, along with their inhibiting concomitants. Something akin to this takes place in normal men who perform certain actions which they would not dream of performing with a fuller knowledge of the circumstances involved. The condition has been summed up in such sayings as "Where ignorance is bliss 'tis folly to be wise," and "Fools rush in where angels fear to tread."

The so-called functional psychoses, hysteria and psychasthenia, including the obsessions and phobias, offer us a most extensive field for the study of the mechanism of psychic contrasts and the influence of these upon conduct and adaptation. Hysterical subjects are notoriously unstable, and they present the strangest contrasts and paradoxes in thought and action. These are frequently nothing more than the external manifestations of contrasting ideative processes, ranging from simple to the most complex. A simple example is afforded by the tendency of the hysterical subject to act contrary to a given injunction. One meets with this condition episodically in people who are not commonly regarded as hysterical. The notion of refraining from coughing or yawning may bring with it the contrary desire to cough or yawn, which often proves irresistible. In this respect hysterical people present features of infantilism reminding us of the common tendency in infancy to act contrary to a given injunction.

Hysterical and neurasthenical subjects who display great devotion to a particular cause are often driven thereto by contrary notions and emotions. Intense egoism and vanity are sometimes translated into acts of altruism and charity. Some who have long dedicated themselves to religious duties and practices subsequently become mastered by erotic and lascivious notions utterly in contrast with their vows. The truth would seem to be that the antithetic notions and tendencies have never been entirely wanting, though they have not occupied consciousness to the same extent, and that after years of inhibitions and repressions on one hand and exaltations on the other there ensues a period of nervous exhaustion (to which various factors may contribute) which disturbs the inhibitory balance in favour of those elements the activity of which has hitherto been kept in check, so that the latter are now allowed free course. The eroticism and immorality displayed at the climacteric period by some individuals, men and women, who have not hitherto been regarded as hysterical, whose conduct, however, at this time makes strange contrast with their previous behaviour, is doubtless to be explained on similar lines.

In many phobias and impulsions we have examples of the coercive power which contrasting notions may exert. The thought of doing some action or the desire to avoid some deed which is out of harmony with the proper personality brings into consciousness a number of notions correlated with the action in question. The sufferer is in most instances painfully conscious of the irrational character of the contention which ensues between the ideas alternating in his consciousness, but despite his efforts his conduct is dominated by the irrational contrasting notions and emotions.

The neurasthenic who trembles at the notion of suicide may one day be impelled to an act of self-destruction. Apart from actual neurasthenia, recognized as such, we sometimes hear of sudden suicide in the case of individuals who have not previously given evidence of disturbed mental balance and where inquiry fails to reveal any assignable motive for the act. It may be suggested in such cases that the idea surprises consciousness in a weak moment when the regulative powers are low. The antithetic notion which should normally come into consciousness, supported by a train of associated ideas, the excito-motor resultant of which tends to action in an opposite direction, fails to be evoked. It remains inactive or feebly active in the unconscious and the morbid idea of suicide finds its motor path unobstructed. There is no contest for or against. There is no inhibition. The end is inevitable. The thought is translated into the deed. Possibly the same reasoning is applicable to linguistic tics—in the form of coprolalia exhibited by many insane persons, who, when they had control of their faculties, were never known to utter obscene language.

Many delusions of the insane may find their only explanation in the coercive domination of ideas which are brought into consciousness by the mechanism of contrast. I cite the case of a woman brought to the asylum because of delusions of grandeur which led her to lay claim to the possession of a valuable estate in England, bequeathed to her, she imagined, by a noble lord. Inquiry showed that she was indeed in very humble circumstances, but a very devoted mother to two young children. Deserted suddenly by her husband and confronted with poverty, which destroyed her plans and paralysed her actions for her children's future welfare, the contrasting notion of wealth and of the benefits it confers took possession of her consciousness and became the nucleus of an organized system of delusions.

It is not my purpose here to discuss the various other elements concerned in the genesis of delusions. It is sufficient at the moment to say that investigation will show that in very many instances, more particularly in the case of primary delusions—that is, those which are not immediately dependent upon hallucinatory disturbances—the delusional ideas have been brought prominently into consciousness, in the first instance, by the mechanism of psychic contrast.

There is one other point to which I wish in conclusion to make brief allusion. Contrast, as we have seen, is a fundamental and important element in the psychic mechanism, inseparable from the acquisition of knowledge of the outer world; but knowledge of the outer world implies the reception of energy from the external universe. The contrasts which are revealed to us in the intimate natures of objects and relations become facts of consciousness, but it is true that all psychic products resulting from the transformation within the nervous system of the various forms of cosmic energy tend ultimately to find expression in movement, in the form of speech and action. In this transformation and extrinsication of energy we recognize all that is included in the terms "behaviour" and "adaptation."

Within the limits of normal psychic functioning we are frequently conscious of the play of contrasting notions and emotions with correlative intuitions or impulsions to movement on the one hand and inhibitions and repressions on the other.

Whether it be in the form of deliberation and reasoning to a conclusion without immediate action of a gross kind, or the weighing of the pros and cons with determination to immediate action, the conflict between the opposing tendencies, intense though it may be, does not greatly disturb the personality, provided there is a definite issue and harmonious adaptation. Where, on the contrary, there is vacillation and indetermination consequent upon the monopolization of consciousness by contending notions and emotions, conflict becomes distinctly morbid, because on the one hand it restricts psychic action within unduly narrow limits, preventing the utilization of a great part of the mental capital, and on the other hand it interferes with the reception and assimilation of stimuli from without which are the constant accompaniments of normal relations with the environment.

It is clear that the psychology of conflict which has occupied such a prominent place in recent literature cannot be adequately and rationally discussed without a full appreciation of the part played by contrast in the normal psychic mechanism, more particularly in relation to all the processes involved in ideation and emotion, attention, discrimination, judgement, choice, volition, and inhibition.

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EPILEPSY AND GUNSHOT WOUNDS OF THE HEAD.

[*Abstract.*]

Dr. W. Aldren Turner (London) said that out of 18,000 cases of gunshot wounds of the head under the Ministry of Pensions 800, or less than 5 per cent., have developed epilepsy. It is met with in two classes of case: (1) following slight trauma without obvious injury to the skull or brain; (2) true traumatic epilepsy, following injury to the skull or brain, and associated usually with paralytic symptoms. In the first class it is often difficult to say how far the fit may be attributable to the head injury, but it is an important point on account of the number of ex-service men who have received a minor gunshot wound of the head and who state they have in consequence become epileptic.

In true traumatic epilepsy the disability is characterized by seizures having the characters of ordinary epilepsy which may follow injury of any part of the brain except the cerebellum, independent of the extent or severity of the lesion. The time of onset of fits after injury varies from six months to two or three years. Jacksonian epilepsy is rare in comparison with the incidence of ordinary traumatic epilepsy.

Traumatic epilepsy following wounds of the brain is attributable in part to the injury, but in greater part to the constitutional disposition of the patient; local conditions at the seat of injury only in part explain the phenomena. The very small percentage of cases of gunshot wound of the head which develop epilepsy is remarkable, especially when it is known that "anchoring" of the brain to the scalp and the extensive destruction of the skull associated with paralytic symptoms are, in the majority of cases, not associated with epilepsy.

The Medical Officer of Health for Cairo City in his recently issued report for 1920 states that during that year 40,054 vaccinations were carried out by the medical officers of the inspectorate and districts. Of these 30,623 were primary vaccinations, principally of native children. The corresponding figures were 27,292 in 1919, and 25,613 in 1918. The number of cases of small-pox notified during 1920 was 157, as compared with 1,455 in the previous year.

The second international congress of military medicine and pharmacy will be held in Rome next spring, beginning on May 28th. The first congress was held in Brussels in July, 1921. The chief subjects for discussion at Rome will be the general principles of the evacuation of the sick and wounded, the co-operation of civil and military authorities in the prevention of disease, chemical laboratories in the field, and the treatment of penetrating wounds of the chest. The subscription is fr. 25. Further particulars can be obtained from the Director of the *Giornale di Medicina Militare* at the Palazzo del Ministere della Guerra, Rome.

THE SURGICAL TREATMENT OF GASTRO-JEJUNAL AND JEJUNAL ULCERATION.*

BY

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I have elected to bring before your notice to-night a record of surgical failures, believing that one way to progress lies in the study and analysis of our unsuccessful cases.

While the surgical treatment of gastric and duodenal ulcer is for the most part highly successful there remains a percentage of patients who are not cured or even relieved by surgical measures, and of that residuum probably the most unsatisfactory are the subjects of secondary ulceration, either gastro-jejunal or jejunal. I say they are the most unsatisfactory because not only are they not cured, but very often they are in a worse condition than they were before operation. This complication has occurred most frequently after the operation of gastro-enterostomy, and it has been stated that it does not follow operations of partial gastrectomy. This, however, is not true, and cases are now beginning to be reported after these operations. The reason for this false impression is that until recently the operation of partial gastrectomy has largely been confined to cases of carcinoma, which practically never develop secondary ulcers, the necessary factor of hyperchlorhydria being absent. Now that partial gastrectomy has become established as a surgical treatment for gastric ulcer I have no doubt that an increasing number of cases will occur.

No variety of operative procedure on patients suffering from gastric or duodenal ulcer is immune from this complication, whether it be gastro-enterostomy, partial gastrectomy, excision of the ulcer, or pyloroplasty. From the published records, however, it would seem to be specially prone to follow operations for duodenal ulcer, operations en-Y, and with entero-anastomosis. The reason for this is the high degree of hyperchlorhydria which is usually found in duodenal ulcer, and, in the case of the special types of operation, the fact that the unneutralized gastric contents come into contact with jejunal mucosa.

It is believed by some that secondary ulcer is more likely to follow anterior than posterior gastro-enterostomy. It is very difficult to form a reliable opinion on this point, but what is evident from a study of the recorded cases is that true jejunal ulceration is relatively more frequent after anterior gastro-enterostomy, probably because the farther we descend the intestine the less tolerant it is to the action of the gastric juice.

The actual cause of the secondary ulceration is as obscure as the cause of the original ulcer for which the operative treatment was undertaken. That it is due in some way to the action of the gastric juice is evident from the situation of the ulceration—for example, on the anastomotic opening, on the jejunum opposite the stoma, on the efferent loop just beyond the anastomosis. That it is associated with hyperacidity is also beyond doubt, and probably this acidity is a factor in the production of the ulceration. We are still, however, in the dark as to the causation of the hyperacidity.

Errors in technique have been held to be largely responsible, especially the use of a Murphy's button or an unabsorbable continuous suture. In a series of cases I collected and published in the *British Journal of Surgery* (vol. vi) there were 14 cases out of 145 where Murphy's button had been used and 13 where an unabsorbable suture played an important part in the production of the ulceration. Nevertheless cases have occurred where catgut only has been employed.

The use of clamps and other technical methods have been blamed, but there is no definite proof that such methods are especially prone to be followed by ulceration. We are confronted with the fact that secondary ulceration may follow any technique and may even occur in the absence of hyperchlorhydria, though this is not common. We are driven to the conclusion, therefore, that the cause of the original ulceration is still at work in these cases, and has not been removed by the operation, and this is borne out by the great liability to recurrence in these patients, many of whom have been operated on repeatedly.

When we know the cause of gastric and duodenal ulceration we shall also know the cause of gastro-jejunal and jejunal ulceration.

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* A paper read before the Liverpool and Manchester Medical Societies.

My object now is to analyse the small series of cases that have been under my care, with special reference to the surgical treatment that has been employed, and, if possible, to come to some conclusion as to the methods which are most likely to be successful. Most of these patients have been under observation for some considerable time—a condition which is essential if we are to form a true estimate as to the results of treatment. Many of the cases reported on as cured have been followed for only a few months after operation, a period which is much too short. My experience is that relapse is very common and may come on a year or more after operation.

I have had under my care seven cases of secondary ulcer, five of whom were originally operated on by me and two by other surgeons. Multiple operations have been done in most cases, and the results have been disappointing. I propose to give only a bare outline of the cases, and not to bore you with clinical details. The first three of these have been reported previously.

CASE I.

Male, aged 32. On May 6th, 1916, he had an anterior gastro-enterostomy for stenosis of the duodenum due to ulceration. Two rows of silk suture were used. In October, 1916, he had a sudden acute pain in the abdomen, and after this he had more or less continuous pain until December, 1916, when I reopened him. He had an ulcer of the efferent loop just beyond the anastomosis and adherent to the anterior abdominal wall. The ulcer was excised, and a silk suture, which was found lying in it, was removed. On October 3rd, 1917, he was living in Leeds, and had a sudden perforation, for which he was operated on in the Leeds Infirmary, the ulcer being sutured. Pain persisted after this operation, so that I operated on him again on November 29th, 1917. The ulcer was still present in the same place, and was still adherent to the anterior abdominal wall. The gastro-enterostomy was cut off, the opening in the stomach closed, and the affected loop of jejunum was resected and joined up by lateral anastomosis. A posterior no-loop gastro-enterostomy was then made, catgut alone being used. The patient remained well until the early part of 1919, when he began to have more indigestion. This persisted for some time, and did not really disappear until I fitted him with an abdominal support, as he had a fair degree of ptosis. Since then he states that he has felt a different man, and is now in good health.

CASE II.

Male, aged 40. He was operated on by another surgeon for duodenal ulcer in December, 1915, the operation being posterior gastro-enterostomy with two rows of linen thread. Pain recurred in a few months' time, and he was reopened by the same surgeon in September, 1916, who performed an entero-anastomosis. Much induration was noted at the gastro-enterostomy stoma, and a length of linen thread was attached to it. This was removed when the entero-anastomosis was made. The symptoms rapidly recurred, and in December, 1917, I was asked to take him over, as his surgeon had to be absent on military service. On December 22nd, 1917, I operated on him, and cut off the anastomosis, which was the site of ulceration, and closed the openings in the stomach and the jejunum by a plastic operation. I excised the old duodenal ulcer, which was healed, by an elliptical incision, closing this transversely. The pylorus being patent, nothing further was required or done. Since that time the patient has been completely free from symptoms, and is now in perfect health.

CASE III.

Male, aged 43. Perforated duodenal ulcer in January, 1912. Suture of the perforation and posterior gastro-jejunostomy with silk sutures. Indigestion reappeared in two years' time. Second operation, April 25th, 1918. Much induration and contraction of the stoma and transverse mesocolon were found. The gastro-enterostomy opening was excised, the opening in the stomach was closed, and the cut ends of the jejunum were joined by end-to-end union. Radiographic examination later showed fair permeability of the pylorus, so nothing more was done. The patient remained in good health until about six months ago. Since then symptoms of stenosis have gradually developed, for which I propose to operate.

CASE IV.

Male, aged 49. Operation in August, 1918, for bleeding duodenal ulcer of three years' standing; posterior gastro-enterostomy and infolding of the ulcer; catgut alone was used for the sutures. Pain recurred six weeks after the operation. He was operated upon again on January 17th, 1920. An ulcer was found on the mesenteric border of the jejunum opposite the stoma. The anastomosis itself was free from ulceration. The anastomosis and jejunal loop were resected, the gastric opening was closed, and the jejunum joined by end-to-end union. A Kocher's gastro-duodenostomy was made because of the stenosis of duodenum. After a period of freedom lasting several months the symptoms recurred, and he was again reopened on December 31st, 1920. The gastro-duodenostomy opening was found to be almost obliterated, and a posterior gastro-enterostomy was again made. The patient is now free from ulceration, but has some reflux vomiting owing to adhesions round the efferent loop—no doubt the result of repeated operative interference.

CASE V.

Male, aged 36. Operation, February 17th, 1917. Posterior gastro-enterostomy for duodenal ulcer. Relief for about six months, and then he had recurrence of pain and vomiting. A second operation was done in June, 1920. Gastro-jejunal ulceration, with stenosis of stoma, was found, and the pylorus and duodenum were also stenosed. Pyloroplasty was done, resection of the stoma being left for a future sitting. This gave so much relief that nothing more has been done. For six months he was completely free from pain, but since then he has had occasional slight attacks of indigestion lasting about three days. His weight at the time of the second operation was 10 st.; now it is 12 st. 3 lb.

CASE VI.

Male, aged 40. Operation for perforated duodenal ulcer, October, 1919. Suture and posterior gastro-enterostomy (catgut only). Recurrence of pain three months later. Radiographically circular spasm of stomach was seen starting at stoma. Second operation, February, 1920. A small ulcer was found on the upper angle of the stoma. It was necessary to open the stomach to confirm this. The ulcer was excised locally, the resulting opening being closed with catgut sutures. The patient was readmitted to hospital on December 8th, 1920, suffering from severe haemorrhage. He was too ill for operation, and one pint of blood was transfused. He had a second less severe haemorrhage on December 12th, and then began to improve. On January 21st, 1921, he was operated on, and a thickened and stenosed stoma was found; the site of active ulceration. An attempt at pyloroplasty failed to produce a satisfactory opening, and therefore a partial gastrectomy was done, the anastomosis being included in the portion removed. The technique employed was a posterior Polya en-Y as advocated by Moynihan.

The patient complained of pain again in September, 1921, and still has pain and, he says, vomiting. He has been admitted to hospital and dieted carefully, and never vomits while he is in, and also he gains in weight. Radiographic examination reveals nothing, the stump of the stomach emptying freely.

CASE VII.

Male, aged 47. Gastro-enterostomy in 1914 by another surgeon for pyloric stenosis. Relief for three years and then recurrence of pain. Latterly he has lost weight, but does not vomit unless he makes himself sick to relieve the pain. The radiographic report is as follows: "Stomach atonic and four inches low; moderately slow emptying through stoma." Second operation, December 6th, 1921. Active duodenal ulcer adherent to head of pancreas is still present. Stoma is much thickened and stenosed. The mesocolon is thickened and contracted. Partial gastrectomy by posterior Polya method was done.

When we analyse the methods employed in this small series we find that three have been left with the food taking the normal channel through the pylorus—namely, cases 2, 3, and 5. In two of these three cases no operation on the pylorus was necessary to enable the food to pass. In one a plastic operation was required. In two the gastro-enterostomy was cut off and in one it was left untouched—namely, case 5. The striking feature in this case was the rapid subsidence of symptoms when the plastic operation enabled the gastric contents to pass normally, and so relieved the stoma of the necessity of acting. The relief experienced was comparable to that afforded by the operation of gastro-enterostomy in duodenal ulcer with partial stenosis.

The results are: Cure in one case, where there was no pyloric stenosis originally, and where the original ulcer was excised at the time of the last operation. Relief for three years in a case where the pylorus was deformed, and then gradual onset of stenosis of the pylorus. Complete relief for six months and then partial recurrence of symptoms in the case where a plastic operation on the pylorus was necessary.

Two cases are left with a posterior no-loop gastro-enterostomy. In one (Case 1) there was a recurrence of symptoms about fifteen months after the last operation, but he is now well and eating ordinary food. I think the recurrent symptoms were possibly due to ulceration, though he has derived great benefit from wearing a ptosis support. The other patient (Case 4) is cured as regards ulceration, but has some reflux vomiting, which is controlled by gastric lavage.

Two patients have had partial gastrectomy (Nos. 6 and 7). No. 7 is too recent for any reliable opinion to be formed. No. 6 has pain, but how far one can rely on his statements is a little doubtful as he is a pensioner, and while he is under observation in hospital he does not complain much. It is somewhat significant, however, that he has a total acidity of 127 and free HCl of 60.

The operative methods at our disposal are:

1. *Local Excision of the Ulcer.*—This was employed on two occasions in the present series, and it was successful in neither.

2. *Cutting off the Gastro-enterostomy*, and the formation of a fresh anastomosis.—This was employed in Cases 1 and 4, two fresh anastomoses being necessary in Case 4, the gastro-duodenostomy done at the second operation being closed by ulceration. The ultimate result is moderately successful in both.

3. *Partial Gastrectomy.*—Employed on two occasions in the present series. Probable recurrence in one patient. The other operated on too recently for report. The drawback to this operation is that one is almost driven to an operation en-Y.

4. *Cutting off the Gastro-enterostomy, and Restoration of the Natural Channel.*—Where there is no pyloric stenosis, as in Case 2, this is the most satisfactory operation of all. Even where a plastic operation is necessary the ultimate outlook is fairly good. It is essential that the original ulcer, if still present, should be excised, and if this had been done in Case 3 I think that we should have avoided the stenosis which has gradually come on. The reason I did not do this was that the original ulcer was a perforating one, and the adhesions round the pylorus and duodenum were very dense.

Conclusions.

The conclusions one has arrived at are:

1. That operations for gastric and duodenal ulcers are to be regarded only as incidents in the treatment, and that diet, etc., and medical treatment should be persisted in after the operation for a long period.
2. That in addition to care in the technique it is preferable to use an absorbable suture material.
3. That any possible primary cause for the ulceration, such as an inflamed appendix or gall bladder, should be sought for, and if found removed.
4. That it is a mistake to occlude or otherwise deform the pylorus. This is unnecessary for the cure of the ulcer and deprives us of our best line of retreat should secondary ulcers form.
5. That when secondary ulcers have formed it is best to cut off the gastro-enterostomy and restore the natural channel if necessary by a plastic operation. The original ulcer, if still present, should be excised at the same time.
6. Where this is impossible and a fresh anastomosis is necessary operations of the Y type should be avoided.
7. Care is required after the operation for a long time.
8. That when one is operating for a perforated ulcer it is better to avoid gastro-enterostomy if possible, as so many of these cases recover completely without any recurrence of symptoms after suture of the perforation.

I have only touched on the subject of simple uncomplicated secondary ulcer to-night. The consideration of the various complications and their treatment would be much too wide a subject for the time at my disposal, and I have had none of these difficult cases under my care.

PROSTATECTOMY IN A CASE OF DIABETES INSIPIDUS.

BY

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AND

F. S. KIDD, F.R.C.S.ENG.

THE performance of prostatectomy in a case of diabetes insipidus does not appear to have been previously noted, and the presence of giant bladder, without evidence of renal or vesicle failure, is of interest.

Clinical History.

The patient, a grocer, aged 55, has had diabetes insipidus for at least twenty years. Probably he has had the condition longer, for twenty-five years ago he noticed that he was passing an unusually large amount of urine and that he was more thirsty. There is nothing in his past history to indicate the cause of the disease. He has led a very regular life, and his only excess has been bicycling. From the age of 18 to 35 he was accustomed to ride very long distances, often doing one hundred miles in a day, and riding all the test hills.

During the last twenty-five years the amount of urine passed has varied between 9 and 15 pints, the average amount in the twenty-four hours being 11 to 12 pints. He has suffered no discomfort beyond the inconvenience of having to micturate frequently and the excessive thirst. At one time he used to drink beer and whisky, but he found he required such a large amount of fluid that he soon gave up alcohol, and for many years has taken only plain water. In cold weather he drinks it warm, as he finds that this quenches his thirst more readily.

His general health is good, and he leads an energetic life. His weight has not varied for many years. He usually has a furred tongue, and is inclined to constipation. His blood pressure is normal (130 mm. Hg), but his pulse is always rapid (90 to 100). He has had various spells of treatment, but no drug has had any effect in reducing the amount of urine. After a course of ergot he developed boils. Restriction of fluid merely increases the thirst, so for many years he has taken a glass of water, day and night, whenever he felt the desire; and, as his work is in his own shop, he has been able to carry on in spite of the frequent calls to pass water. He drinks over two gallons a day. The urine has for many years been pale and watery, acid in reaction, and with a specific gravity of 1002 to 1005. Occasionally there has been a faint trace of albumin, but never any sugar.

During the winter 1920–21 he first noticed pain in the suprapubic region, and at the end of the penis, on passing water, with increasing frequency and some hesitation. As the weather got warmer this trouble diminished, but he still had occasional pain in the penis, and felt that he was not emptying his bladder completely. Throughout the summer he was practically free from pain, but in the late autumn of 1921 the difficulty of emptying the bladder returned, with resulting increased frequency and pain. By the end of the winter the trouble had so much increased that he was not getting sufficient sleep, and was becoming quite worn out. The urine had for some time contained staphylococci and coliform bacilli, but as neither drugs nor vaccines improved the condition removal of the prostate was decided on.

Surgical Report.

Mr. Kidd's report is as follows:

"The patient was referred to me by Dr. Alexander on March 1st, 1922. He stated that for the last three months he had had great pain in the bladder region, a constant desire to pass water, which took a long time to come, and then only came in driblets. He was in pain all the time; he had to get up at least eight times during the night; in fact, his condition was becoming unbearable.

"Abdominal examination showed that he had a giant bladder well up to the umbilicus. Rectal examination revealed considerable enlargement of the prostate gland of an adenomatous type. The urethroscope showed no stricture present. The Wassermann reaction was negative. *X*-ray examination showed no stone present, but a picture taken of the skull revealed hollowing and excavation of the pituitary fossa, suggesting that there was a cystic enlargement of the pituitary gland. . . . Ten to 12 pints of urine were passed in the twenty-four hours, which was very pale, specific gravity 1001, and contained no pus, albumin, nor sugar.

"I looked upon the giant bladder as the result of the diabetes insipidus, and not as a sign of advanced vesical and renal failure, as there were no clinical signs whatever of renal failure. Abandoning my usual custom in the case of giant bladder, I therefore resolved to pass a catheter for the purpose of renal function tests. Indigo injected into a muscle of the leg came through the kidneys in eight minutes, and in less than half an hour it had stained the urine a deep blue colour. This shows the value of time tests of renal function. The dilute urine made no difference whatever to the indigo test. The blood urea was 10.7 mg. per 100 c.cm. of blood, a very low quantity (the normal being 15 to 40 mg. to 100 c.cm. of blood). The exact significance of this I do not know, but the observation appears to be of interest.

"Urea concentration test = 1st hour—730 c.cm. of urine came through the catheter, specific gravity 1003, urea 0.4 per cent., total urea 2.92 grams; 2nd hour—770 c.cm. urine, specific gravity 1003, urea 0.4 per cent., total urea 2.98 grams.

"Cystoscopy showed a very definite but quite small middle lobe and two small lateral lobes projecting upwards into the bladder, with marked trabeculation of the bladder.

"Operation was performed in one stage on March 10th, 1922. The prostate was enucleated. It consisted of two small lateral lobes and a small valvular middle lobe.

"After the operation the patient made 11 to 13 pints of urine a day, and it had to be collected in two large slop pails. He was passing all his urine naturally on the seventeenth day and went home soundly healed on the twenty-seventh day, passing 11 pints of urine freely with a good stream and without pain."

Five months after the operation the patient's condition is altogether satisfactory; his general health is very good, and he is free from all pain. He passes his urine with a good stream, though he states that towards the end of micturition he feels as if he had to use his abdominal muscles to help. He has, for him, good nights, only having to get up two or three times. In the day he can hold his water two and a half to three hours: he still passes 10 to 12 pints of clear watery urine in the twenty-four hours.

PARALYSIS OF THE FACIAL NERVE WITH HERPES ZOSTER.

BY

C. T. NEVE, F.R.C.S.ENG.,

ASSISTANT SURGEON, CROYDON GENERAL HOSPITAL.

THE facial nerve becomes paralysed more frequently than any other single nerve in the body, and yet the cause of this paralysis is in most cases unknown. In a certain small percentage it is due to inflammation of the wall of its canal in the bone, following on disease in the middle ear, or to trauma, operative or otherwise. Rarely it is caused by a central lesion, or is part of a polyneuritis, being then often bilateral. Again, it may accompany or follow a herpes of the face or neck, and is then generally supposed to be due to the inflammation of zona affecting the geniculate ganglion. But in the majority of cases no definite cause can be found; and, in default of a better explanation of the onset of this paralysis, exposure to cold is blamed. In view of the frequency with which this factor occurs in everyday life, it must always be considered unsatisfactory except as a merely contributory cause. From the nature of the case, material for pathological examination can be obtained but rarely. Inquiry must be made chiefly by clinical means.

It is the object of this article to show that herpes zoster affecting the geniculate ganglion is a much more frequent cause of facial paralysis than is commonly supposed, and that many if not all the cases where exposure to cold is blamed are due in reality to that micro-organism, at present unknown, which, attacking the posterior root ganglia of the spinal nerves, and the homologous ganglia of the cranial nerves, produces the interesting train of symptoms called herpes zoster.

Doucet (*Thèse de Paris*, 1906) collected 26 cases of herpes associated with facial paralysis. Analysis of these cases shows that the eruption appeared in the following situations: face, 27 per cent., neck 19 per cent., auricle 4 per cent., tongue and palate 19 per cent., face and neck 27 per cent., face, neck, and mouth 4 per cent.

Hearing was affected in 4 cases out of the 26—twice when the eruption was on the face only, once when on face and neck, once when on neck alone. Taste was diminished in 2 cases—associated once with herpes of the face and neck, once with herpes of face only. In 3 cases paralysis of one side of palate was noticed—once each with herpes of face, neck, and mouth. Three cases of herpes of the auricle are included, but in none of them was hearing affected.

No single one of these cases collected by Doucet showed all the symptoms which may be present in a case of the complete "syndrome of the geniculate ganglion." These are—as described by Ramsay Hunt in the following year—herpes auricularis with facial palsy and affection of the auditory nerve.

It is evident from the consideration of these cases, and indeed from everyday clinical experience, that the symptoms which have been mentioned—herpes zoster of face, neck, ear, or mouth, paralysis of facial nerve, auditory nerve affection, diminution of taste—may occur grouped together in almost every possible combination. Facial paralysis may be associated with one or all of these other symptoms; no one of them is essential, neither herpes of ear, herpes of face or neck, nor affection of the eighth nerve.

If facial paralysis associated with herpes zoster is due to the inflammation of zona affecting the geniculate ganglion, those fibres whose affection causes the appearance upon the ear of the characteristic herpetic vesicles present in the complete syndrome of the geniculate ganglion often, indeed usually, escape. Thus in only 3 of the 26 cases collected by Doucet was the auricle affected. If this is so when the Gasserian ganglion is attacked together with one or other of its homologous ganglia, the Gasserian or posterior root ganglia of the second and third cervical nerves, why should it not be so when it occurs as an isolated lesion—that is, why should not facial paralysis be the sole symptom of an inflammation of the geniculate ganglion caused by the same virus which produces typical herpes zoster elsewhere?

Such an explanation fits in with the course and symptoms of a case of "idiopathic" facial paralysis. As in herpes zoster, there is often preliminary malaise; in children sometimes fever. Commonly, too, there is prodromal pain. In herpes zoster an enlargement and tenderness of the lymphatic glands draining the area of skin on which the eruption later appears, but preceding that eruption, are almost invariable. I have not found such enlargement reported as occurring in facial paralysis, but it was present in a recent case of mine. The history of this case is as follows:

The patient, a male aged 21, previously healthy, on October 24th began to have pains behind the right ear and down the neck posteriorly on right side. He did not feel well; his throat was sore. On October 29th he felt a little tender lump in front of ear. October 30th: He woke up to find that his face was one-sided. When examined the same day he said he felt out of sorts; his ear felt "dull" and his tongue rough; he felt giddy. There was complete right facial palsy of the lower neurone type. One tender lymphatic gland in front of tragus of ear and one beneath lobule. No other glands palpable. Skin normal; auditory meatus and membrana tympani normal. Fauces slightly reddened, but no vesicles seen. No deafness to whisper or to acoumeter, but a low-toned tuning-fork was heard longer on affected side than on right. Taste normal; no nystagmus or Rombergism.

During the next few days his general condition returned to normal, and auditory and sensory symptoms disappeared. Facial paralysis persisted, showing only slight improvement after two months. The affections of taste and hearing in this case were so slight that a less observant patient might not have remarked on them.

It seems probable that in many cases of apparently uncomplicated facial paralysis there will on inquiry be found some slight symptoms pointing to an affection of the geniculate ganglion, and leading one to suppose that the paralysis is a neuritis due not to exposure to cold but rather to inflammation in the geniculate ganglion, the facial fibres suffering severely, while those which carry the sensation of taste—the pars intermedia—and those of the adjacent eighth nerve have almost, if not completely, escaped.

DYSTOCIA DUE TO GIGANTIC FEMALE FOETUS.

BY

E. L. MOSS, C.M.G., M.C.,

MAJOR, R.A.M.C.

A WOMAN, aged 22, was admitted to the Louise Margaret Hospital, Aldershot, on March 22nd, 1922, with oedema of the legs and face, and albuminuria. Her periods had been regular up to the last one, which began on July 25th and ended July 30th, 1921. Quickening was felt about the first week in December. She had had one normal confinement two years before, when a healthy female child weighing 10 lb. was born. The mother and father are both six feet in height.

On admission the patient had marked oedema of face, lower abdomen, vulva, and legs. The abdominal enlargement was much greater than usual, and suggested multiple pregnancy and hydramnios. On palpation the uterus was so tense that the only foetal part distinguishable was the vertex, and even this was difficult to define. Only one foetal heart was heard, on the right side, between the umbilicus and anterior superior spine. The fundus reached to the ensiform cartilage. A tentative diagnosis of hydramnios and multiple pregnancy was made.

The pelvic measurements were as follows: Intercristal 12 in., interspinous 10¾ in., external conjugate 8½ in., inter-tuber ischii 4¼ in. By vaginal examination the promontory could not be reached. The blood pressure was 160 mm. of mercury on admission, but after three days it fell to 130 mm.

The urine contained a heavy cloud of albumin, but no pus cells or renal casts; ammonia nitrogen 0.23 gram, urea nitrogen 0.7 gram, a slight trace of acetone and diacetic acid. On culture it yielded a coliform organism.

The urinary condition and oedema cleared up satisfactorily under treatment with vapour baths, saline aperients, and a course of potassium citrate, followed by urotropine and acid sodium phosphate (given separately), combined with light diet.

The patient was kept under observation in hospital, and on April 26th, at 8.15 p.m., the membranes ruptured. Pains began at 9 p.m. The vertex was felt presenting in the R.O.A. position. Pains continued regularly, but not very strong, and at 3 a.m. on April 27th the os was fully dilated. After one and a half hours in the second stage, as there was no advance of the head, which was engaged in the brim, and as the foetal heart sounds were still heard, axis traction forceps were applied under anaesthesia, and the head brought to the outlet after considerable difficulty. The delivery of the head through the outlet between the pains was very difficult owing to its large size. A loop of cord feebly pulsating could be felt above the head.

Obstruction to the further birth of the child occurred at this stage owing to the shoulders being wedged across the brim of the pelvis in the right oblique diameter. Attempts at digital traction with the finger in the posterior axilla failed. A blunt hook was therefore used, with the result that the shoulders were brought sufficiently low down for the arms to be disengaged and delivered alternately. The child was stillborn. The perineum was ruptured, but the tear did not extend through the sphincter ani. The

placenta followed forty minutes later and appeared perfectly healthy, but weighed 4 lb.

The puerperium was uneventful. The patient was sitting up and well on the twelfth day.

Particulars of the Child.

Weight (verified by separate weighing machines, and observers)	24 lb. 2 oz.
Length—vertex to heel	35 inches.
Length of spine	15½ ,,
Bis-acromial	8½ ,,
Length of arm	13 ,,
Length of foot	5¾ ,,
Circumference of thigh	10 ,,
Circumference of forearm	7 ,,
Bi-trochanteric	6 ,,
Head circumference	19 ,,
Bi-mastoid	4½ ,,
Bi-malar	4½ ,,
Suboccipito-bregmatic	5¼ ,,
Suboccipito-frontal	6¼ ,,

The *post-mortem* examination was confined to examination of the brain. The bones of the vertex were harder and exhibited a greater degree of ossification than usual. The anterior fontanelle was smaller than usual. On opening the skull the dura was firmly adherent to the calvarium, and the brain was so soft and diffluent that it could not be removed intact; it was put into formalin solution, but after twenty-fours had fallen to pieces. A portion of the pituitary was saved and examined, but merely exhibited undue vascularity of the pars anterior.

The foetus is preserved in the Museum of the Royal Army Medical College, Millbank, London.

Induction of labour or Caesarean section would have been considered had it been possible to diagnose a foetus of such large size. Pelvimetry had shown that the maternal passages were abnormally large. The difficulty was that the uterus was so tense with excessive liquor amnii and the large foetus that its contents could not be palpated clearly. It was not reasonable to anticipate trouble with a pelvis of this size, especially as we had in mind the probability of hydramnios and twins, and knew that a 10 lb. baby had been born without trouble previously.

Cleidotomy was not performed because at the stage when it suggested itself as a means of overcoming the difficulty with the shoulders it was still hoped to get a living child.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A CASE OF CONGENITAL PYLORIC STENOSIS.

THE occurrence of congenital pyloric stenosis in female children is, I believe, of sufficient rarity to be worthy of note.

A colleague called me into consultation upon a marasmic female infant aged 3 weeks. It was a second child, the first being a healthy boy, and labour had been normal. The mother appeared perfectly healthy and was feeding the child herself.

The child commenced to vomit its feeds when about 10 days old; at first this was so slight that it was considered to be a mere regurgitation caused by slight digestive disturbance, as frequently happens. During the next four days the vomiting increased and the child began to waste rapidly. Various dietetic changes were tried, but without success. In the third week the vomiting became really projectile in type, even the smallest feeds of albumin water being returned. These were the conditions when I was called in; in addition there were scattered râles over the bases of both lungs.

A feed was given to the infant in our presence, and within a minute well-marked slow peristaltic waves could be seen passing across the abdomen from left to right in the region of the stomach. This peristalsis was apparently painless. Shortly afterwards the vomiting began and was projectile in type. A thickening could be felt in the region of the pylorus. The stools up to this time had been normal, showing no signs of failure of digestion, but the apparent constipation now present was another point in the diagnosis.

Given these symptoms—namely, projectile vomiting, visible peristalsis in the gastric region, palpable thickening in the region of the pylorus, apparent constipation, and marked wasting—a diagnosis of congenital pyloric stenosis was made. I am indebted to Dr. Frederic Still for the following notes giving details of the treatment:

"The operation was performed by Mr. Tyrrell Gray, after repeated subcutaneous saline infusions had produced a slight rally. I was watching for the moment when it might be just possible to operate, for the child was in an almost desperate condition when I first saw it about eighteen hours before operation. It was not only extremely feeble and somewhat blue, but there were sharp râles all over the bases of both lungs.

"We took advantage of the temporary rally, and Mr. Gray did the Ramstedt operation—that is, a simple longitudinal incision through the muscular layer of the pylorus without cutting through the mucosa. The child stood the operation well, and with further subcutaneous infusions rapidly gained strength, and has since kept down its breast-milk feeds well."

The infant has progressed satisfactorily, and has gained 1 lb. 2 oz. since the operation three weeks ago. This gain is perhaps less than might be expected, but is to be attributed chiefly to the deficiency of breast milk after the temporary weaning.

According to statistics, the condition is rare in female children, 80 per cent. of cases occurring in boys (Garrod, Batley, and Thursfield, *Diseases of Children*), and more commonly in first children.

Kidderminster. V. N. FENTON, M.B., B.Ch.Camb.

AUTOGENOUS VACCINE IN PUERPERAL FEVER.

I WISH to bring before country practitioners the efficacy and great assistance of autogenous vaccines in the case of puerperal fever. Lately I had a case as follows:

The birth was by means of forceps delivery with small tear in the perineum. This was stitched. Four days later, after having been given castor oil, the patient's temperature rose and the lochia ceased. Immediately intrauterine douching (twice daily) was commenced and salol and hexamine were administered every four hours. This treatment went on for five days with little or no success. The pulse ran up to 120–130. The temperature was 105° in the morning and 101° in the evening on an average. On the sixth day 20 c.cm. of a well-known make of stock polyvalent anti-streptococcus serum was given, with no result. On the next day 10 c.cm., similarly with no result. The heart condition now began to show slight indications of commencing endocarditis.

I examined a loopful of the discharge from the cervix and identified coliform organisms and streptococci. I then sent a loopful of this discharge for the preparation of an autogenous vaccine.

As the action of the heart was becoming weak, heart stimulants were now used, chiefly digitalis, with caution, for fear of embolism, but even in moderately large doses the result was disappointing. Antipyretics were of little use, although small doses of aconite helped a little.

Four days after the dispatch of the specimens (with all due credit to the Royal College of Physicians' laboratory, Edinburgh) I received the autogenous vaccine, each cubic centimetre of which contained 50 million coliform organisms and 50 million streptococci. I gave 1/10 c.cm. immediately, and progressively doubled this dosage every twenty-four hours, till the patient was receiving approximately 1 c.cm. every twenty-four hours. The results were marvellous. The temperature fell as if by magic, and on the sixth day after the commencement of treatment by the autogenous vaccine the endocarditis had cleared up and the temperature was normal. Recovery was now well established. The vaccine was still continued for some days (1 c.cm. every twenty-four hours).

I wish to draw attention to the fact of the absolute failure of the stock serum in this case; in fact, after administration serum manifestations caused the patient's condition to become worse.

Cowdenbeath. JOHN VEITCH, M.B., Ch.B.

ELECTRICAL TREATMENT IN TUBERCULOUS DISEASE.

IN the BRITISH MEDICAL JOURNAL of June 4th, 1921 (p. 812), I described experiments I had performed for the destruction of bacilli by electricity. Since that date I have treated an obstinate case of tuberculous colitis by galvanism with an excellent result.

The patient, aged 26, was sent to me by his doctor, who suggested that as I had destroyed staphylococci and *B. coli* by an electrical current it might be possible to kill the tubercle bacillus in the same way.

Nearly two years before I saw the patient he had mild diarrhoea and passed blood and mucus. He had previously had an empyema which had been operated upon and the wound healed. The diarrhoea was continuous and did not respond to drugs. Wasting was marked and the temperature high. An autogenous vaccine had been prepared and a course given with no apparent improvement in the symptoms. Later (nine months before I first saw him) appendicoscopy was performed and daily the colon was washed out with saline, silver nitrate, and sometimes Dakin's solution, other antiseptic

drugs being administered by mouth in turn. Still no marked improvement was shown.

I first saw the patient in September, 1921, when he was passing a large quantity of blood and mucus. He was pale and thin. For half an hour three times a week I passed a galvanic current through the abdomen, making him lie on one large pad and placing the other on the anterior abdominal wall.

In April, 1922, he was passing one stool a day and no blood and very little mucus. The weight had increased by several pounds, and the patient himself admitted he was feeling better than he had ever done in his life. At the end of May treatment ceased, and he returned to his laboratory work.

I saw him again last month and he said he was perfectly well, was above his normal weight, and was passing normal stools with no blood or mucus.

Brighton. P. C. Collingwood Fenwick.

Reviews.

OPIUM AND COCAINE IN INDIA AND BURMA.

In a small book entitled *Drug Smuggling and Taking in India and Burma*[1] Mr. Roy K. Anderson, superintendent of the Burma Excise Department, tells the ugly story of the abuse of opium, morphine, and cocaine with reasonable fairness, though the writer to some extent disarms criticism by stating at the outset that he is not an authority on the subjects dealt with. He has, at any rate, had very intimate acquaintance with the smuggler and his tricks through his knowledge of customs and excise and the elaborate system of preventive men, as well as paid informers whom he has been compelled reluctantly to employ.

He relates the history of the introduction of opium into India, presumably by the Arab conquerors in the eleventh century; their faith forbade alcohol, but they found solace, it is suggested, in opium and Indian hemp, much as the aborigines of Peru indulged in the leaves of the coca plant. Mr. Anderson is prepared to justify "the moderate use of opium," without venturing on a definition of that much abused word "moderate," and seems inclined to condone the chewing of coca leaves. Nevertheless, he is emphatic in his condemnation of the "awful results of this damnable traffic in drugs"; he asserts that morphine is abused by hundreds of thousands, and speaks of the results of the indulgence in cocaine as "truly deplorable." He appears to regard the smoking of opium as less injurious than eating opium, thus differing from the official view propounded in the recently published *Truth about Indian Opium*, which sought to justify the ingestion of the drug by natives while condemning smoking as "essentially a social vice."

Mr. Anderson will probably find many to agree with him in the view that the gin palace is more antisocial in the distress it occasions than is the opium den, but the interesting illustrations which he supplies are sufficient to confirm his statements as to the disastrous effects on the physical, mental, and moral condition of the victims of opium or coca. Indian hemp, he holds, does not get a similar hold upon its addicts, and the habit is given up with less difficulty. Mr. Anderson confirms the allegations which have been made as to the extent of smuggling of morphine derived from Great Britain, the Continent of Europe, and Japan, carried on by ships' crews; as much as 500 oz. have been seized in one haul, and for every ounce seized he believes a pound goes in undetected. The author entirely approves of the Dangerous Drugs Act passed here in 1920 and calls for international co-operation in controlling this hateful traffic. No more humanitarian labour could at the present time engage the activities of the League of Nations.

PSYCHOLOGY AND PSYCHOPATHOLOGY.

Many of the more popular and elementary books on the "new psychology" give the impression that their writers are somewhat hazy in their views themselves, and this is perhaps the reason they are apt to mystify rather than illuminate their readers. It is therefore a pleasure to read *The Psychology of Medicine*,[2] by Dr. T. W. Mitchell, who has not only made a close study of the development of medical psychology during the last twenty years, but has the gift of presenting his subject-matter in a particularly clear, orderly, and balanced manner. After an introductory chapter in which the aims and scope of the book are indicated, the phenomena and theories of dissociation, repression, the unconscious, psychoanalysis, dreams, the neuroses, and psychotherapeutics are described. In a chapter on the prevention of neurotic illness a general account is given of the environmental factors which exert an unfavourable influence upon the emotional development in childhood, but the author points out that the more we know of the complexity of the conditions on which the occurrence of a neurosis depends the less sanguine are we of being able to prevent its development by avoiding any one of them. The book may be recommended to the student of psychological medicine who is desirous of obtaining an adequate preliminary knowledge of the various schools of psychotherapy. The title of the volume is perhaps somewhat misleading, as it suggests a much wider theme than the author proposes to consider.

In the treatment of nervous cases Dr. William Brown believes it possible to have a sound system of psychotherapy which combines mental analysis with suggestion and auto-suggestion. He has developed this view in a small volume entitled *Suggestion and Mental Analysis*[3]; it is written on popular lines, and deals more particularly with the theory and practice of suggestion as taught by M. Coué, whose recent demonstrations in this country attracted a good deal of notice. Dr. Brown expresses his appreciation of what he describes as M. Coué's clear and penetrating insight into the facts of suggestion, but he points out quite truly that medical men have employed for many years the methods of treatment which M. Coué advocates, and that they have been in a position to apply them with more understanding because of their knowledge of the facts of mental and physical disease. Having given some account of suggestion, mental analysis, the psychoneuroses, and hypnosis, Dr. Brown suggests that in the causation of functional nervous conditions two general factors are at work—mental conflict and bad auto-suggestion. He holds that as the result of mental conflict the mind is weakened; there is a weakening of mental synthesis, with the result that the individual shows a tendency to be readily overwhelmed by emotion and readily carried away by certain ideas if supported by certain feelings. It is the existence of these two factors which, in the author's experience, necessitates a combined method of treatment. The mental conflict is resolved by mental analysis, and the bad habits of mind resulting from bad auto-suggestion are treated by counter-suggestions communicated to the patient while in a state of somnolence. Dr. Brown maintains that when the patient has been treated along these lines for a few hours he is brought into a position to carry out the practice of auto-suggestion. Dr. Brown does not write from the strictly scientific point of view; he quite frankly insists on a religious attitude as part of the necessary equipment of the psychopathologist, and introduces the phraseology of mysticism into his suggestive therapy. These views are rather perplexing; we should have thought it particularly desirable for the psychopathologist to maintain an impersonal and objective outlook, and to avoid any tendency to approach his clinical material through the medium of his personal attitudes and desires, as otherwise he will find himself involved in functions which are outside the sphere of the doctor and will inhibit his usefulness in the investigation of disease and its causes. We do not doubt the value of the form of therapy which Dr. Brown advocates, though some of his theoretical views would seem open to question; suggestion is a biological process which exerts a considerable influence on mental development, and it is quite to be understood that, when applied with the precision which previous mental exploration makes possible, it may have considerable therapeutic value.

DIABETES.

The publishers of the interesting collection of books dealing with the diseases of middle age may be congratulated on the practical value of directing attention to the special danger of the fifth decade of life. One particular danger besets most men and some women at this age—namely, the tendency to eat too much and to exercise too little. It is the age when we begin to pay for success in our business or profession by

[1] *Drug Smuggling and Taking in India and Burma.* By Roy K. Anderson, F.R.G.A., Superintendent, Burma Excise Department. Calcutta and Simla: Thacker, Spink, and Co. (Copies may be obtained from W. Thacker and Co., 2, Creed Lane, London, E.C.4.) 1922. (Cr. 8vo, pp. iv+104; illustrated. 7s. net.)

[2] *The Psychology of Medicine.* By T. W. Mitchell, M.D. London: Methuen and Co. 1921. (Cr. 8vo, pp. vi + 187. 6s. net.)

[3] *Suggestion and Mental Analysis: an Outline of the Theory and Practice of Mind Cure.* By W. Brown, M.A., M.D.Oxon., D.Sc. London: University of London Press, Ltd. 1922. (Cr. 8vo, pp. 165. 3s. 6d. net.)

being able to indulge in the pleasures of the table and by driving in a motor car instead of walking. At a time when we need nourishment the least we can often afford it best—or rather our bank balance can afford it, whereas our metabolic exchange may crash. Dr. LECLERCQ points this out clearly in his book on diabetes.[4] Since 1911, he reminds us, he has been insisting that glycosuria is the result of a disturbance of protein metabolism rather than of carbohydrate excess. Without going so far as to say that he overestimates the importance of the protein origin of the blood sugar in diabetes, we think Dr. Leclercq is not supported by facts when he rejects carbohydrate excess as a factor in the production of diabetes. Colonel McCay's observations in India cannot be ignored quite so completely. The review that Dr. Leclercq gives of the physiology of the liver and its functions is admirable, and so is his summary of the whole experimental data bearing on sugar production and elimination. But when he comes to expounding his own theory that diabetes is a defensive mechanism whereby many toxic products of erratic protein metabolism are transformed into sugar for the purpose of harmless excretion we feel he is largely and boldly speculative. The conjunction of protein disturbance with that of carbohydrate metabolism has rightly been insisted on by Marcel Labbé, and it is fully realized how seriously this conjunction aggravates an error of mere carbohydrate metabolism. There are, however, grounds for not accepting the author's suggestion that diabetes can be averted in the early stages by restricting protein foods, especially meat, and increasing the carbohydrate intake. He makes an arresting suggestion for the treatment of diabetic coma and uraemia; it is that since subcutaneous injection of phloridzin causes a glycosuria with hypoglycaemia, this drug might rid the blood of the toxic substances responsible for diabetic coma and uraemia. Unfortunately, Dr. Leclercq has not sufficiently tested his theory by practical trial. In fact, whilst the whole book is full of stimulating ideas, some of these ideas would have been better employed as the basis of careful experimental research. John Hunter's greatest contribution to the art and science of medicine was his advice to Jenner, "Don't think, try."

In his general preface to the library of medical knowledge he is editing Dr. APERT wins our whole-hearted approval when he explains that the series of short monographs on special subjects is written in the vernacular—that is to say, in everyday French, technical words being used as little as possible and then only after what they mean has been explained. Medicine, the editor continues, is no longer the secret art of former times; his aim is to free medical writing from the cabbalistic formulas inherited from our forefathers that may have matched the "long robe" and the gold-headed cane well enough, but now serve only to make obscure the subjects treated. In the volume before us[5] Dr. RATHERY has condensed into small compass present-day views about diabetes. The sum of our real knowledge might have been still more briefly expressed. Even in this little book room is found for a good deal of highly speculative theory. We find the statement that "arthritisme" provides many examples of disturbed nutrition. Dr. Rathery confesses that no one can define "arthritisme," but he agrees that it represents an indispensable idea. Indispensable ideas are great stumbling blocks to scientific progress. Dr. Rathery succumbs to the ruling passion for classification, and offers us a choice of three fundamental varieties of diabetes—a simple, a consumptive, and a mixed form. "Diabète consomptif" strikes us as a term devoid of all value or justification; the editor has failed here in his aim at simplifying and clarifying the language of medicine. On the whole the book is not one that we can recommend to English readers.

THE MAYO CLINIC.

THE thirteenth volume of *The Collected Papers of the Mayo Clinic*[6] (Rochester, Minnesota) contains 108 articles contributed by seventy-six of its indefatigable workers, headed by the famous brothers, W. J. and C. H. Mayo. The contents, already published elsewhere, though sometimes in rather inaccessible periodicals, impress the reader with an admiration for the activity of this great graduate medical centre.

The articles are arranged under nine headings dealing with the alimentary, urogenital, endocrine, blood, cutaneous, and nervous systems, the head, trunk, and extremities, technique, and general subjects. The first contains the largest number (23) of articles, and among them attention may be called to Dr. R. A. Carman's "Errors in the Roentgenologic diagnosis of duodenal ulcers," Professor E. C. Rosenow's "Focal infection and elective localization of bacteria in appendicitis, ulcer of the stomach and pancreatitis," and to Dr. H. R. Hartman's account of hydrochloric acid in gastric carcinoma, showing that achlorhydria, which is so generally regarded as an essential diagnostic sign, was present in rather less than 50 per cent., and a normal or hyperacid value in more than 25 per cent., of 631 cases. In the course of an address dealing with carcinoma developing on gastric ulcer, which at one time seemed to occur with rather startling frequency at the Mayo clinic, Dr. C. H. Mayo says that it is now advisable to drop the percentage basis, and in speaking of carcinoma generally, predicts that from the recent developments of serum, endocrine, *x*-ray, and radium treatment, surgery will become an adjunct to these methods instead of the major treatment. In the section on urogenital diseases Drs. Bumpus and Meisser continue their experimental study of foci of infection in pyelonephritis, and show that infection of the kidney may often be due to focal infections in the teeth, tonsils, and elsewhere harbouring streptococci which have a selective affinity for the urinary tract, and that the colon bacillus, so commonly found and regarded as responsible, is of secondary importance.

There are two reports by Dr. Bumpus and by Dr. V. C. Hunt on submucous ulcer of the bladder, and there are papers dealing with functional tests of the kidney. Professor Reginald Fitz deals with the much neglected subject of the prevention of some cases of chronic nephritis—namely, by the removal of septic foci in the teeth and tonsils. Dr. W. M. Boothby writes on the basal metabolic rate in hyperthyroidism, Dr. L. B. Wilson on the pathological classification and diagnosis of malignant tumours of the thyroid, and Dr. William Mayo on splenectomy in splenic anaemia and Banti's disease. Professor E. C. Rosenow and Dr. Winifred Ashby's report on focal infection and elective localization in the etiology of myositis is based on the examination of 28 cases in six years, and the injection of pus or streptococci from the tonsils or teeth into rabbits; in 24 cases the streptococcus was found to have an elective affinity for the muscles. Among the general articles there is an especially interesting address by Dr. William Mayo, "In the time of Henry Jacob Bigelow," delivered, on his receipt of the Bigelow medal, to the Boston Surgical Society. In conclusion, this veritable storehouse of information on the recent advances in medicine has been admirably edited by Mrs. M. H. Mellish.

DISEASES OF THE DIGESTIVE SYSTEM.

THE twenty lectures contained in the fifth series of Professor MAURICE LOEPER'S *Leçons de pathologie digestive*[7] were delivered partly in the course of general pathology in the Medical Faculty of Paris and partly at the Tenon Hospital, and deal both with the pathogeny and with the clinical and therapeutic aspects of disease of the alimentary tract. The subject-matter is interesting for its variety as well as for the views expressed. The mechanism of the nervous manifestations of intra-abdominal disease receives much attention, and illustrations of structural change in the vagus in ulcer and in malignant disease of the lesser curvature of the stomach are given, cancerous infiltration of the nerve explaining cardiospasm in such cases of gastric carcinoma. In another lecture, on painful crises in the course of malignant disease of the oesophagus, in one form of which angina pectoris is imitated, infiltration of the vagus and phrenic nerves is described. Similarly, in the discussion of coelialgia, neuritis in dysentery and cancerous invasion of the nerves in the mesentery is figured. Coelialgia is divided into the primary forms, as in tabes, syphilis, and syringomyelia, and the forms secondary to various causes, visceral and toxic, such as lead; an interesting example of the latter condition is described in an oxaluric patient with crystals of oxalic acid in the semilunar ganglion. The importance of the estimation of pepsin in the gastric juice, the significance of

[4] *Le Diabète et son traitement.* Second edition, corrected and enlarged. By Dr. Arthur Leclercq. Les maladies de la cinquantaine. Tome ii. Paris: Gaston Doin. 1922. (Demy 8vo, pp. 268. Fr. 15.)

[5] *Le Diabète sucré.* By Dr. F. Rathery. Bibliothèque des Connaissances médicales (Dr. Apert). Paris: Ernest Flammarion. 1922. (Cr. 8vo, pp. 294. Fr. 7.50.)

[6] *Collected Papers of the Mayo Clinic, Rochester, Minnesota.* Edited by Mrs. M. H. Mellish. Vol. xiii, 1921. Philadelphia and London: W. B. Saunders Co. (Med. 8vo, pp. xiii + 1318; 392 figures. 60s. net.)

[7] *Leçons de pathologie digestive* (cinquième série). Par Professeur M. Loeper. Paris: Masson et Cie. 1922. (Demy 8vo, pp. xii + 348; 53 figures. Fr. 15.)

pepsin in the urine, and the proper method of administering pepsin by the mouth form the text for three other lectures. The cachexia of gastric carcinoma is correlated with an excess in the blood serum of toxic albuminous bodies produced by a proteolytic ferment resembling erepsine, which is secreted by the growth; as a defensive measure antiproteolytic bodies are manufactured in the serum, and as this process is favoured by the administration of trypsine this means of treatment is advocated. Evidence is brought forward to show that the grave anaemia of gastric cancer is due to the haemolytic effects of albuminous and lipoid bodies in excess in the serum, and to counteract this the administration of cholesterol or more simply of yolk of egg is recommended. Other chapters are devoted to plastic linitis (carcinomatous) of the pelvic colon, the gastric symptoms of gall stones, phlegmonous gastritis (with the details of a case due to gassing), and the dietetic treatment of gastric disorders; but enough has been said to show the stimulating character of Professor Loeper's work.

NOTES ON BOOKS.

PHARMACISTS and dispensers must have a ready memory for a great number of facts such as the nature of the active constituents in galenical compositions, their proportions in compounded articles, and the magnitudes of medicinal doses. These must for the most part be acquired by simple effort of memory. Were this not the case there would have been little excuse for the production of GWYNETH PENNETHORNE'S *Guide to Assistant's Examination in Materia Medica and Pharmacy*,[8] for the contents of the volume consist chiefly of those memoranda in their briefest form; the work can hardly be said to teach the subjects of its title on an educational plan. Something may perhaps be said for beginning a subject with the facts to be memorized and taking up a more rational scheme of study afterwards. Thus applied this book may be useful since its contents are substantially free from inaccuracy. It has, moreover, a budding element of merit above that of such books as are intended to do no more than circumvent the tests expected from the examiner; a number of hints given on methods of dispensing are well conceived. A moderate addition of explanatory matter would have greatly enhanced the value of the book. For example, the article on milk sugar contains the sentence, "It is used as a diluent of powerful drugs," but nothing is said to indicate the properties which render milk sugar the most suitable of materials for that purpose, although one or two short sentences would have sufficed. Obviously a more complete treatise will be required by those who are to escape the dangers of possessing only a little knowledge, but an edition of this work interleaved with blank pages for the notes of the user might be found serviceable by a considerable number of students of materia medica and pharmacy.

Dream Fairies[9] is the title of a collection of enjoyable verses written for children by Dr. T. WILSON PARRY, and illustrated in black and white by Mr. Gerald Aylmer. The little volume is redolent of the English countryside, and should prove a delight to the innumerable children who love birds, butterflies, brooks, frogs, flowers, and fairies. Mr. Aylmer's apt sketches really illustrate the text, and he shows an excellent sense of design in his pen-and-ink drawings. Personally, we liked his pictures of little girls (as on p. 4) better than his fairies, but we confess that a child who was shown the drawings greatly preferred the fairies to the children.

Under the title *Massage and Exercises Combined*,[10] a Mr. ALBRECHT JENSEN of New York has published an illustrated account of a course he has devised of mild gymnastic exercises, combined with self-massage and breathing exercises. The book is addressed rather to the general public than to the medical profession, and contains a number of superfluous adornments such as a display of high-sounding adjectives on the title-page and a portrait of the author on art paper as a frontispiece. The exercises themselves, however, are not without merit, being simple and requiring no undue straining nor any gymnastic apparatus.

ERRATUM.—The price of Dr. L. Emmett Holt's *Diseases of Infancy and Childhood*, published by Messrs. D. Appleton and Co., is *35s.*, not 6s., as by a clerical error was stated in our issue of September 23rd at page 566.

[8] *Guide to Assistant's Examination in Materia Medica and Pharmacy, Apothecaries' Hall.* By Gwyneth Pennethorne. With a Preface by P. A. Ellis Richards, F.I.C., F.C.S. London: Baillière, Tindall, and Cox. 1922. (Fcap. 8vo, pp. xi + 266. 6s. net.)

[9] *Dream Fairies.* By T. Wilson Parry. London: Simpkin, Marshall, Hamilton, Kent, and Co. 1922. (Demy 4to, pp. 34; illustrated. 2s. 6d. net.)

[10] *Massage and Exercises Combined.* By A. Jensen. New York: A. Jensen, Box 73, G.P.O., New York City. 1920. (Sup. roy. 8vo, pp. 93; 85 illustrations. 2.50 dols.)

THE ORGANIZATION AND FINANCE OF VOLUNTARY HOSPITALS.

SIR NAPIER BURNETT'S REPORT.

SIR NAPIER BURNETT, Director of Hospital Services for the Joint Council of the Order of St. John and the British Red Cross Society, has just published his third annual report[1] on the voluntary hospitals in Great Britain, excluding London. This report contains the result of his examination of the statistics of the voluntary hospitals for the year 1921. It deals not only with the financial status of the hospitals, but also with the quality of their work and their relative efficiency. As the hospitals in the London area are under the supervision of the King Edward VII Hospital Fund they are not included.

The object of these annual reports is thus twofold—namely, to present to the public detailed information regarding the financial position of the voluntary hospital system, and to assist hospital governors and administrators with information whereby they may ascertain how their hospital position compares with the group averages of other comparable institutions. As regards the financial side of the problem, it is interesting and encouraging to note that in the year under review the majority of the provincial voluntary hospitals were able to pay their way for the first time since the war. As prices were high at the beginning of 1921 and unemployment was rife during the latter part of the year, the hospitals may now look forward with rather more confidence to the future, and it is expected that the figures for 1922 will show an even better position.

Classification of Hospitals.

The classification adopted in the present as in previous reviews is according to size or the number of available beds; the hospitals are further grouped into general and special, and the latter are subdivided according to the age and sex of patients and to the nature of the ailments treated—for example, eye or ear and throat hospitals. Sir Napier Burnett considers, however, that such classification is unsatisfactory and that a new method of grading hospitals is required. Thus, two hospitals with the same number of beds show in their annual reports that one has cost 50 per cent. more than the other, and the impression produced when they both appeal to the public for support may be that the one hospital is extravagant and inefficiently administered in comparison with the other. The true position may be, on the other hand, that the hospital showing the higher cost is really the more economical, in that it is supplying a much fuller service to the public than its neighbour. One, for instance, may be provided with a full range of special departments, including bacteriological and pathological laboratories for the investigation of the causation of disease, while the other hospital merely acts as an infirmary for sick folk and has few facilities for the study of disease. Such hospitals are not at all comparable from the point of view of service rendered to the community, and yet as they are graded at present, according to size, the public have not the knowledge of how to discriminate.

Sir Napier Burnett considers that hospitals may be graded according to the quality of the work that they do and the facilities they provide for carrying out such work. The group of hospitals known as teaching hospitals, in that they are associated with medical schools, should, in his opinion, be graded as a group apart from all other hospitals. Excluding the teaching hospitals, he suggests that other hospitals could be graded into classes A, B, and C, according to their general standard of equipment and laboratory facilities, etc. On such a basis the subscribing public would have the knowledge to enable them to appreciate why the class A hospital is necessarily more expensive than one in class C.

It may be remembered that a few years ago the American College of Surgeons decided to carry out a survey of the hospitals in the United States and Canada with 100 or more beds. Of these there were 697, and the object of the survey was to ascertain how many of the hospitals conformed to the minimum standard of efficiency laid down by the College—namely, the keeping of proper clinical records by the

[1] *Third Annual Report on the Voluntary Hospitals in Great Britain (excluding London) for the Year 1921.* By Sir Napier Burnett, K.B.E., M.D., F.R.C.S., F.R.C.P., with an introductory note by the Hon. Sir Arthur Stanley, G.B.E., C.B., M.V.O. Published by the Joint Council of the Order of St. John and the British Red Cross Society, 19, Berkeley Street, London, W.1. Price 2s. 6d.

hospitals, an organized staff of surgeons, and adequate laboratory facilities. In 1918–19 only 89 of the 697 hospitals attained this minimum standard; in the next year 198 attained the standard; in the year afterwards 407 met it, or agreed to meet it; and in 1921, when the report was published, it was hoped that the number would be nearly 550. It was evident, therefore, that the adoption of a minimum standard gave a considerable impetus to the improvement of the medical service within the hospitals, although the American College had no authority to impose any standard on any hospital, except the authority of the ideal. There is no doubt that the average standard of the provincial hospitals in England is at present high, but there is no reason why it should not be higher still. If, therefore, the Joint Council takes up the improvement of the scientific and professional standard of the provincial hospitals as part of its work it will confer considerable benefit upon the community.

Hospital Income and Expenditure.

Taking Great Britain as a whole, excluding London, details of patients were received from 642 voluntary hospitals—that is to say, from 88 per cent. of the total hospitals—with 39,973 available beds. It was found that 2,545,055 individual patients were treated during 1921 at a total cost to the hospitals of £5,275,176. Towards this expenditure the hospitals received £4,854,661, leaving a deficit on the year's working of £420,515. One-third of the total ordinary income of the hospitals was derived from workmen's contributions and patients' payments. While in 1920 44 per cent. of the provincial hospitals were able to show a financial surplus on the year's work, in 1921, despite the financial depression and the extent of unemployment, the number of hospitals with a balance on the year's working increased to 51 per cent. As was the case in 1920, only one group of hospitals—the small or cottage hospital group—showed an excess of income over expenditure, but it was also the only group that showed an increase of expenditure over that for 1920. It is probable, however, that these small hospitals receive the benefit of the reduction in the price of hospital commodities some time later than the larger hospitals, who are able to buy in greater quantities—an argument in favour of collective buying. Taking in review the figures for the past three years, there is gratifying evidence of the progress that is being made by the hospitals to improve their financial position. An increase of ordinary income was shown in the three different groups of hospitals—that is, in hospitals of varying bed capacity. The small or cottage hospital group fell back in income last year by £2 per available bed as compared with the previous year. Taking the hospitals as a whole, the figures show the deficit per available bed has fallen from £15 in 1919 to £10 in 1921. The total amount of the accumulated debts to the banks of the provincial hospitals in England and Wales amounts to £681,368, while the invested funds of the hospitals, including both realizable and non-realizable or trust funds, amount to £5,913,943.

Hospital Provision for Patients of Moderate Means.

In Sir Napier Burnett's view the hospital provision for patients of moderate means is probably the most urgent problem calling for solution in the hospital world. The hospital of to-day is a much more expensive institution than its predecessor of twenty years ago, in a large measure because of the many advances that have been made in scientific medicine and surgery during those years. To keep abreast of these developments elaborate and expensive apparatus is required, and new departments have to be established to meet the demands of specialists. The benefits of these scientific advances are now available for the poor in the public hospitals and for the rich in private hospitals, but those with moderate means, who are debarred from the private institution because of the cost and yet are above the income limit for admission into the public hospital, suffer a real hardship in being unable to participate in the benefits of modern hospital scientific resources. Sir Napier Burnett believes that the full solution of this problem will not be reached until the medical profession come to realize that the payment of a hospital medical staff is really centred in the question of the provision of hospital beds for this class of the community. He makes an appeal to the medical profession to take this matter into consideration and to act in an advisory capacity to those hospital governors and trustees who are seeking solution of the problem.

Central Fund for Provincial Hospitals.

At the annual meeting of the British Hospitals' Association in Liverpool last May a resolution was passed approving of the formation of a central fund for provincial hospitals on the lines of the King Edward VII Hospital Fund for London, and asking the council of the Hospitals' Association to take the matter into active consideration. In London there are 112 hospitals which come under the supervision of the King Edward VII Hospital Fund and receive grants and guidance from that body. There are 641 voluntary hospitals in England and Wales and 90 in Scotland, a total of 731, but there is no similar fund in existence for assisting the hospitals in the provinces. Sir Napier Burnett says that, having visited the great majority of the hospitals in the provinces, he has been impressed with the eagerness with which information regarding other hospitals is sought for with the object of benefiting from the experience of others. The hospitals have practically no relations with neighbouring hospitals, and this spirit of isolation reveals itself in the annual reports, which show an almost complete absence of uniformity in keeping accounts or of recording other statistics. The establishment of a clearing house of hospital administration would be one of the main functions of a central fund, and the essential need of such a fund for provincial hospitals is to enable some influence to be brought to bear upon the hospitals, through grants of money, in order to secure a higher standard of administration and a greater degree of uniformity in their statistical returns, and in order to eliminate duplication and overlapping of effort. The Central Fund could have its own technical staff, who would make periodical examinations of each hospital, both as to management and financial arrangements, and on these inspectors' reports the Central Fund would be in a position to allocate grants on a satisfactory basis.

THE MEDICAL DEFENCE UNION.

THE annual statutory general meeting of the Medical Defence Union, Ltd., was held at Birmingham, in the offices of the Birmingham Panel Committee, on September 28th. The President, Sir CHARLES A. BALLANCE, K.C.M.G., C.B., M.V.O., was in the chair, and upwards of forty other members were present.

In moving the adoption of the report of the Council for the year 1921–22 the PRESIDENT congratulated the members on the satisfactory progress made by the Union during the last three years. The membership was now over 10,000, and the Union could justly claim to be the largest and premier organization of the kind in the country. The number of new members elected in 1921 was 661, but in the current year 979 new members had already been elected—a far greater number than had been elected in any previous year since the Union had been founded. This, he said, was an indication of the extent to which the Union was recognized by the profession as a protection in its hazardous calling, and he paid a warm tribute to the tactful and efficient conduct of the cases dealt with by the general secretary and the solicitor. It was particularly appropriate that the annual meeting should be held in Birmingham, in which city the registered offices of the Union had been located for some six years in its earlier days. In view of the close association of the Union with Birmingham in the past it was, however, to be regretted that the present membership in Birmingham compared unfavourably with that in several other large teaching centres, and he hoped those present would make it their business to rectify the matter without delay. The medical practitioner should not only consider his own selfish interests. He should be prepared to support his brother practitioners and to uphold the prestige of the great profession to which he belongs. No one engaged in medical practice could afford to plough his own furrow or to dispense with the protection afforded by a medical defence organization. The letters received almost daily were testimony to the assistance members obtained in their difficulties from the experienced and efficient action taken by the Union on their behalf. Moreover, as a member of the Union, a practitioner not only protected himself against unjust actions, but was helping to protect others.

The annual report of the council and the financial statement for the year 1921 were adopted unanimously.

The usual statutory resolution was passed and a hearty vote of thanks to the president and council for their services during the past year concluded the proceedings.

British Medical Journal.

SATURDAY, OCTOBER 7TH, 1922.

LETHARGIC ENCEPHALITIS.

Few epidemic diseases in modern times can have aroused more general interest or provoked so much discussion and research as lethargic or epidemic encephalitis. The student of the literature of this disease may well be dismayed at its immense mass and will welcome the appearance of the report issued by the Ministry of Health, an analysis of which appears at page 654. Some such sifting of the accumulated pile of clinical and pathological material was badly needed, and in taking stock of the results of work extending over nearly four years we may be glad to find how much solid achievement can be recorded. In the first place, it is now generally conceded that the disease is a definite clinical and pathological entity. The pathology rests on a sure foundation of established fact, and although the actual histological changes found in the central nervous system may closely resemble those in other conditions, and notably in acute poliomyelitis, yet there are differences sufficiently distinctive to enable the experienced pathologist to make a definite diagnosis in any given case.

The large amount of experimental work performed in this country, in America, and on the Continent, has been successful in establishing that the cause of the disease is a filtrable virus closely analogous to that of acute poliomyelitis. One of the most recent and hopeful achievements of experimental work has been the artificial production of an immunity to the disease in rabbits by vaccination with the living virus. Clinical observations have been equally fruitful in results. Indeed, the number of "types" or varieties of the disease reported has proved confusing. But despite the almost bewildering number of shapes under which the disease may appear there are yet some characteristic clinical pictures. Of these the first and most important is that which Netter originally described as the "triad" of symptoms, consisting of somnolence, fever, and ocular palsies. Next in importance we would place the form in which the clinical picture of paralysis agitans is produced—the so-called Parkinsonian type. In this form the disease constitutes a very striking and characteristic clinical picture which is even now not sufficiently recognized. Nor is it realized how commonly this Parkinsonian state is progressive and terminates in death within a space to be measured by twelve or fifteen months. Another type, sufficiently striking to deserve a name to itself, is the myoclonic form; it may vary from occasional involuntary muscular contractions, enough just to disturb the patient or arouse the interest of the medical practitioner, to a condition where the patient lies in a classical "typhoid state," to which violent and irregular muscular contractions, especially of the abdominal musculature, lend a profound and, to the experienced eye, a disquieting significance.

To the mental changes induced by the disease too little attention has been paid. Even when the patient seems to have made a good recovery it will usually be found that some degree of mental disability remains. On this point especially we are in urgent need of further information. This uncertainty, and the not infrequent cases in which relapses or recrudescences seem to take place, combine to make prognosis a matter of exceptional difficulty. He will probably be wise who takes pains to emphasize the gravity of the disease save in the most mild cases. Diagnosis also abounds in pitfalls. Except in certain cases—like that of the Parkinsonian type, where the picture is characteristic—it is generally safer to proceed to a diagnosis by way of exclusion than by any other method. The conditions most likely to be confused with it are, according to the report of the Ministry of Health, tuberculous meningitis, cerebral tumour, and cerebral haemorrhage. To this list it would be wise to add syphilis of the nervous system. Obviously, therefore, the aid of the pathologist should be sought in the examination of the cerebro-spinal fluid. For although he may not be able to find any absolutely typical changes, especially in late cases, yet a negative report will often be of great value by excluding tuberculous or syphilitic conditions.

We have already touched on the need for care in giving a prognosis. This caution is especially necessary when it is remembered that as yet we have no specific remedy, though we may hope that the experimental workers will perhaps be able to provide us with a truly specific method of treatment. In certain cases of the Parkinsonian type it seems that the administration of hyoscine in full doses has been productive of good, albeit of temporary, results. The treatment by means of fixation abscess, so much advocated in France, has not been much followed here. Nor has the treatment by urotropine or hexamine been much more satisfactory. In fact, we have yet to find a drug which can exert an effect on such inflammations of the central nervous system as encephalitis lethargica or acute poliomyelitis. It is, perhaps, not out of place to remind our readers that lethargic encephalitis is now notifiable. The value of such notification is apparent when we have an opportunity of studying such a report as that shortly to be published by the Ministry of Health. For without notification this report would have been impossible. Co-operation between all branches of the profession is always desirable, and never so much as in the investigation of a new disease. Such co-operation has been achieved in the case of encephalitis lethargica with the most happy results.

VINDICATION OF THE VICTORIANS.

Some of our younger Georgian writers who have been enjoying the pastime of making the Great Victorians run the gauntlet of their criticism have caused Professor Karl Pearson to empty the vials of his wrath upon their heads. The Director of the Biometric and Galton Laboratories is angry with the rising generation, first, because it attempts to defame Charles Darwin, the greatest of the Victorians, and secondly, because it fails to appreciate the greatness and goodness of Darwin's cousin — Francis Galton. In a centenary appreciation[1] (Galton was born in 1822) Pearson justifies his attitude in hot and vigorous phrases. "The present generation," writes Professor Pearson, "are apt to speak of the Victorian or mid-Victorian age with contempt. . . . They fix their attention on Tennyson's *Idylls*, on a suite of furniture sold in the sixties in Tottenham Court Road, or on a product of the old Art Union, and scornfully mutter 'mid-Victorian!' . . . They forget the revolution in thought which the scientists of the so-called Victorian era—Darwin, Lyell, Maxwell, and Kelvin, to confine our attention solely to British names—brought about. . . . Darwin spent ten years collecting data before he allowed his imagination to play upon them, and then he revolutionized the whole attitude of men towards the biological sciences. In a certain sense it matters little whether the factors suggested by Darwin

[1] *Questions of the Day and of the Fray.* No. xi. *Francis Galton, 1822-1922.* A Centenary Appreciation by Karl Pearson, F.R.S. (20 pp. 3s. net.)

as the causes of Evolution have or have not the full weight he placed on them. What does matter is that his ideas revolutionized the methods of research and teaching in anatomy, anthropology, botany, embryology, physiology and zoology. . . . After Darwin the universe can never be the same to the educated mind as it was before Darwin."

There are few readers of this JOURNAL, whether they be Victorians, Georgians, or, as most of us are, a mixture of the two, who will dissent from the verdict which Professor Pearson has passed on the nature of the revolution which was effected by Darwin. Medical men are too familiar with the facts on which Darwin's theory is based to be perturbed by special pleadings in the popular press. Indeed medical men will the more readily understand the present position of Darwinism because they know how Listerism stands. The superficial observer, when he sees that the modern surgeon no longer douches wounds with strong antiseptics or uses the spray, might conclude that Listerism is dead; but the surgeon himself knows that his modern means of dealing with wounds are based on Lister's teaching. It is so with Darwinism; natural selection, the effects of use and disuse, and the influence of environment may not be the potent forces Darwin supposed them to be—but the truth of evolution stands as firmly as when he left it.

Beyond doubt, Professor Pearson is right in placing Darwin's cousin—Sir Francis Galton—among the great Victorians. The two cousins had points in common, and points which make them interesting studies in contrast. Both laid the fruits of their labours in all humility before their contemporaries; neither sought to unload his wares on the public either by threat or cajolery; anyone who desired their wares might help himself and welcome. Darwin was content merely to formulate his pangenetic theory of heredity; Galton put it to the test of experiment and became a Weismannist before Weismannism was born. Darwin ceased his inquiries when he had proved that mankind was the product of evolution; at the point where Darwin left off Galton began. If evolution can raise mankind from apedom and from the jungle to his present estate, how much farther may it not raise him? This was the question which formulated itself in Galton's mind after the publication of the *Origin of Species* in 1859. He spent the remainder of his life in seeking to discover how evolution can be harnessed in the service of humanity—to pull man himself some rungs up the evolutionary ladder. He discovered the principles of eugenics, and offered his discovery to England as a gift. He was convinced that the nation who adopted this child of his would outstrip all its rivals. Even in the nature of his bequest we realize the difference in the minds of Darwin and Galton. Darwin, having published the evidence, left his theory to its fate; he was a pure scientist, believing in the survival of the fittest. Galton, on the other hand, was an "applied scientist," and believed that even the fittest needed protection. Hence he not only left his child "eugenics" to the nation, but also provided a nursery or laboratory for its maintenance, and the fittest tutor in all England to bring this child to the age of maturity—Professor Karl Pearson.

It cannot be said that the British people, not even that part of it which has been trained in medicine, has shown any undue alacrity in taking the Galtonian bequest to heart. Even Professor Pearson, as one gathers from the opening paragraph of his newly issued pamphlet, is not altogether satisfied with the reception that the present generation is extending to things "eugenical." "The year," he writes, "which forms the centenary of Francis Galton's birth demands more recognition of the part he played in the spread of human knowledge and its application to the future of the human race than appears thus far likely to be forthcoming." For he (Professor Pearson) realizes that the time is hardly suited to impressing on the majority of men a conviction of the futility of most of their aims, of the depth of their ignorance of what makes for progress, and the unsatisfying nature of their present pleasures. No one can say that Professor Pearson seeks for adherents by first intoxicating them with self-satisfaction.

A man who has great talents, who is master of precise methods and a wide knowledge, one, too, who is in deadly earnest, is never the man whom this JOURNAL will treat lightly. We are therefore glad to note in the concluding paragraphs of his pamphlet that Professor Pearson is able to strike the following happier and more hopeful note: "In 1911 Galton died and by his will founded the laboratory which bears his name, a laboratory for the study of national eugenics, for what makes for better breeding in man. It may not be of serious weight, but at least it indicates the tendency of human social evolution when it is reported that during the brief life of that laboratory there has been an increasing number of intelligent inquiries (either directly or, what is more significant, through their medical men) from those about to marry as to the advisability of their proposed marriages, or from those already married as to the morality of their having or not having children." We wish the Galton Laboratory all success, for those who know best the tricks of the little god Cupid will most fully realize the forces which militate against the rationalized matings of human beings, and the obstacles which the Galtonian school has to overcome.

POST-GRADUATE COURSES.

Two recent experiments in arranging post-graduate courses appear to have been so successful as to be worthy of description. A week's course given at Addenbrooke's Hospital, Cambridge, from September 25th to September 30th, was designed to interest general practitioners in the area from which that hospital draws its patients. About 180 notices were sent out, and 60 favourable replies were received. Between 20 and 30 practitioners attended each lecture or demonstration. The difference was accounted for by the fact that those who attended continued to conduct their practices throughout the week, and often lived at a considerable distance from Cambridge, so that each practitioner was only able to attend a few of the lectures. The lectures did not as a rule begin before 11.30 a.m., and the work was finished by 4.30 p.m. The syllabus was drawn up on the basis of a "refresher" course, with illustrations of modern methods of diagnosis and treatment. There were demonstrations by the physicians of some nervous diseases, of diseases of the blood, of cardio-renal cases, and of cases of cardiac irregularities. The surgeons, in addition to operating, gave demonstrations on hip-joint disease and on some surgical aspects of gastric disease. There were demonstrations also of eye, throat and nose, and uterine cases; of the treatment of syphilis and gonorrhoea, and of the simpler methods of the clinical laboratory. Presumably to relieve the monotony of a purely "refresher" course, a short space of time was devoted to bilharziasis in man and to the tubercle bacillus in domestic animals. A week-end course at St. Mary's Hospital, London, also designed for general practitioners, began at 10 a.m. on Saturday, September 30th, and ended at 3.30 p.m. on Monday, October 2nd. On Sunday the work was limited to the morning. Most of the lecturers were restricted to three-quarters of an hour, and arrangements were made for a break in the work, both morning and afternoon, in order that those attending might have opportunity for conversation. Though the announcement of the course had only been sent to a limited number of practitioners, principally old St. Mary's men, the attendance at several of the lectures reached the astonishing total of between fifty and sixty. Some of the practitioners had come from considerable distances in the country, and had thought it worth while to arrange at short notice to spend a week-end in London. The course was

something more than a "refresher" course, and included such subjects as the modern methods of investigating asthma, the clinical application of biochemistry, and the use and abuse of organotherapy. The success of these two courses shows that there exists a demand amongst general practitioners for post-graduate teaching, provided the subjects appeal to them and the arrangements are convenient. The factors in success were probably the time of year, the shortness of the courses, careful selection of the subjects and of the teachers, attention to the comfort of those who attended, and the fact that both courses were free. In all these matters it is clear that the teachers had thought out their plans most carefully, and Dr. Aldren Wright, the secretary at Cambridge, and Dr. C. M. Wilson, the Dean at St. Mary's Hospital, are to be congratulated on the success of their efforts. At the same time it must be said that neither of these successful experiments meets fully the requirements of post-graduate education in England. If this country is to take its proper position in post-graduate teaching it is necessary that facilities should also be provided for practitioners wishing to undertake practical training, particularly in special departments and subjects; that there should be opportunities for training in research; and that in both respects provision should be made for the post-graduate from the Dominions and abroad. Rightly, no doubt, the course at Cambridge was confined to Addenbrooke's Hospital, but there exist in Cambridge teachers and laboratories with every equipment for advanced post-graduate teaching, and it might be possible to arrange suitable courses for suitable students. In London and elsewhere fuller use of special hospitals might be made, and opportunities for research already considerable, could be enlarged. The development of facilities for post-graduate students from abroad is still in its infancy, and needs propaganda, organization, and the provision of social amenities. At the present stage it is probably wise that, where possible, post-graduate courses should be given free of charge, as was the case at Cambridge and St. Mary's Hospital. That a certain demand exists cannot be doubted, and that a much greater demand could be created is probable. It is not too soon to begin thinking out a definite plan for the future. It is possible that on some occasions in the past courses have been arranged which were both too lengthy and too costly. The financial aspect of the matter will require very careful investigation, and must be considered under the separate headings of administrative expenses and the payment of teachers. This discrimination was made by the Fellowship of Medicine when it approached the Ministry of Health last July with the suggestion that the Ministry should give assistance in meeting the costs of administration. The Minister was insistent on the need for the production of a more comprehensive scheme. In this we believe he was right, and it is to be hoped that the Fellowship will take the earliest opportunity to prepare such a scheme. In doing this it may obtain some measure of assistance from the study of the reasons for the success of such ventures as those here described.

"THE GOLD-HEADED CANE."

THE well-known *Gold-Headed Cane*, containing a store of interesting medical gossip, mainly of the eighteenth century, appeared anonymously in 1827, and was followed the next year by a second edition expanded by 88 new pages of biography. The author was William Macmichael (1784–1839), Registrar of the Royal College of Physicians of London (1824–29), and author of the *Lives of British Physicians* (1830); he was also a protégé of the Court physician and President of the College, Sir Henry Halford, disrespectfully described as the "eel-backed baronet" by James Wardrop, M.D., Surgeon to George IV, the witty but sharp-tongued author of "The Intercepted Letters" in the *Lancet* (1834). It is perhaps not a mere coincidence that Sir Henry Halford's biographer and admirer, the late Dr. William Munk, brought out the third and last edition of the *Gold-Headed Cane* in 1884, with the further addition of 76 pages devoted to Sir Henry Halford, Dr. J. A. Paris, and Thomas Mayo, the Presidents of the College from 1820 to 1862, and to shorter notices of Sir W. Browne, Pelham Warren, Sir Thomas Millington, Thomas Wharton, John Conolly and others. The original work purported to be the memoirs of a gold-headed cane carried successively by the famous physicians Radcliffe, Mead, Askew, William and David Pitcairn, and Matthew Baillie, of whom pleasant accounts were given. The actual cane was presented by Matthew Baillie's widow to the College just before the present building in Pall Mall East was opened on June 25th, 1825, with due ceremony, an eloquent Latin Oration by Sir Henry Halford, and a banquet attended by five Royal Dukes. As those interested in medical history have become more numerous the *Gold-Headed Cane* has become more difficult to pick up in second-hand book shops; and, as American physicians have shown their appreciation of the work, it was not unnatural that in 1915 a reprint of the second edition was published by Paul B. Hoeber of New York, with an introduction by Sir William Osler and a preface by Dr. Francis Packard of Philadelphia, the present editor of *The Annals of Medical History*. The second, rather than the fuller third, edition was chosen for reprinting because it had been revised, added to, and published by Macmichael, whereas the third edition, although containing most interesting additions, was "not Macmichael's and therefore not the Cane's." This may be perfectly correct, but probably many readers would be willing to sacrifice this rectitude for the further biographical details contained in Munk's edition. The 1915 reprint has now been exactly reproduced,[1] except that the name of the Oxford University Press, London, appears on the title-page in the place of "New York: Paul B. Hoeber, 1915," and that there is a note to the effect that it was printed in the United States of America in December, 1919, from plates made after printing the first edition. It is excellently got up, and will be extremely welcome to those who have not been fortunate enough to secure copies of the earlier editions.

THE ROCKEFELLER INTERNATIONAL HEALTH BOARD.

THE eighth annual report of the International Health Board of the Rockefeller Foundation has been issued. During 1921 the policy was maintained of furthering scientific research in order to extend its benefits to the public health without regard to political frontiers. Among the larger duties undertaken by the Board is the co-ordination of measures for the control of yellow fever. This disease, which has worked such havoc among the tropical and semi-tropical regions of North and South America, is a problem too difficult to be solved by any nation acting alone. Despite the most rigid quarantine rules the infection overran national boundaries, desolated populations, and paralysed industry and trade. It was found, for instance, that while Guatemala suppressed an epidemic which had spread to sixteen communities on the Pacific coast in 1918, the infection was reintroduced in the following year. Now, by international co-operation, unified control is being administered over the entire region. In each country active measures are carried out by a Yellow Fever Commission created by special decree under the national department of health, and unity of effort is secured by giving the International Health Board representation on each of these Commissions. During 1921 operations for the control of yellow fever were continued in Peru, Yucatan, Central America, and Brazil. The fight against malaria also was kept going and steadily extended, particularly in the southern states of the United States. To meet the growing demand for doctors and sanitary engineers with special training in this field the International Health Board has undertaken to maintain a considerable reserve corps through a period of apprenticeship; on completion of their training they are taken into federal, state, or

[1] *The Gold-Headed Cane.* By William Macmichael, M.D. With an introduction by Sir William Osler, B.A., M.D., F.R.S., and a preface by Francis R. Packard, M.D. London: Humphrey Milford, Oxford University Press. 1922. (Post 8vo, pp. xxiv+261: 12 figures. 16s. net.)

county service. The commission which the Board sent to France in 1917 to aid in organizing a national crusade against tuberculosis is approaching the end of its task. The general policy is to use the funds and officers of the Rockefeller Foundation to start a campaign, and after this has been set going and its purpose is thoroughly understood by the local authority, to leave its continuance to that authority. When the work in France began the French Government and people were staggering under the burdens of an exhaustive war, and had to bear the added weight of a heavy tuberculosis rate which was thought to be on the increase. A great multiplicity of agencies, French and American, official and non-official, pooled their interests and projected a co-operative scheme on a national scale. Tuberculosis dispensaries were established, medical practitioners received special training, a national campaign of popular education was conducted, and the provision of hospital beds and sanatoriums was stimulated. The activities begun in 1917 are now regarded as rooted in French soil. The Commission has therefore been dissolved, and responsibility is being rapidly transferred to French authorities. Another widespread campaign promoted by the Board is that against ankylostomiasis. This was chosen for special consideration, not primarily because of its importance as a disabling disease, but rather because it furnishes so good an object lesson in methods of control. During the year the Board contributed towards demonstrations in hookworm control in 43 states and countries throughout the world. It completed surveys in Brazil, New Guinea, the Solomon Islands, Tasmania, and Queensland; and began surveys in New South Wales, Western Australia, and the Northern Territory of Australia. Reinfection surveys, to determine the results of previous work, and to stimulate further efforts, have been undertaken in the southern United States, Jamaica, and Brazil. Lastly, the Board intends to go on with its plan of contributing largely from time to time towards the development of a limited number of schools of hygiene at strategic points throughout the world.

FOOD POISONING DUE TO TRIFLE.

During the last two or three months some varied types of food-poisoning outbreaks have been encountered. The Loch Maree outbreak of botulism, the first of its kind recorded in these islands, has been referred to in these columns, and there have lately been outbreaks of food poisoning due to Canadian cheese, ascribed to bacterial toxin the nature of which was undiscovered. A few weeks ago an outbreak of food poisoning of another uncommon type occurred. The cause of it, *B. enteritidis* Gaertner, is not the member of the Gaertner group commonly encountered in this country in outbreaks of food poisoning, *B. suipestifer* (*B. aertrycke*), of the "Mutton" type, usually being found. Parenthetically it should be noted that the word "Mutton" is a surname, and the type is not necessarily associated with consumption of mutton, which very rarely gives rise to food poisoning. Early in September a wedding reception was held at Wallasey, attended by some 80 persons. Fully half of those present were attacked, mostly about twenty-four hours later, with severe and persistent colicky pains, severe vomiting, and diarrhoea. It was at first erroneously supposed that foodstuffs had become contaminated with arsenic, as the hall had recently been redecorated internally with green paint. A useful clue to the food incriminated was furnished by the fact that some trifle was given to the caretaker of the hall in which the reception was held, who shared it with several outside persons, who also were attacked with similar symptoms. This hypothesis as to cause was confirmed by investigation of the articles of food consumed by many of the wedding guests, which indicated that trifle was the foodstuff implicated. Of four dishes of trifle prepared for the banquet by a Liverpool catering firm of high standing one remained untouched; from it Professor J. M. Beattie, of Liverpool University, recovered *B. enteritidis* Gaertner; its activity was confirmed by agglutination tests against standard serums and the bloods of several of the patients; in addition, the same organism was isolated from the faeces of some of the patients. The blood of those who prepared the trifles was investigated, with negative result. Up to the present the way in which the trifles became infected remains undiscovered. It is curious that outbreaks of food poisoning, caused by a Gaertner organism, due to consumption of such articles as cream cakes or trifle, though practically unrecognized in this country, are quite common on the Continent, in France especially. The common factors in such Continental outbreaks, which are usually on a fairly large scale, almost always include some festivity at which articles of food of the nature of cream cakes, trifles, etc., containing whipped cream and white of egg, were consumed. In the Wallasey outbreak the trifle is stated to have contained no egg, custard powder having been used. Whether or not egg albumen was present, such an article as trifle would be a suitable culture medium if contaminated by the specific bacillus. These Continental outbreaks have on numerous occasions in recent years been proved to be due to organisms of the Gaertner group. "Carriers" have, in some outbreaks, been incriminated; in the Cholet (France) outbreak, in 1913, 36 persons were attacked at a wedding banquet, 10 with fatal result. The subsequent researches of Professor Chantemesse showed that the female cook who prepared the "crème royale" for this banquet had already been implicated in four previous food-poisoning outbreaks since 1902. In one instance more than half, and in another 70 out of 100, of the wedding guests were attacked; in another instance 25 persons were affected; and at another wedding banquet a number of guests suffered from a similar kind of illness. After the Cholet outbreak this cook was found to be a Gaertner "carrier." There are, however, outbreaks of this kind where no evidence of a "carrier" can be obtained, and in them, where eggs have been used, it is possible that specific infection may have been derived from the egg itself. It is known that Gaertner organisms may cause disease in birds. Sparrows and canaries may suffer from enteritis due to a Gaertner organism. In 1892 *B. psittacosis*, which is probably identical with *B. suipestifer* (*B. aertrycke*), caused in Paris an outbreak in parrots which spread to man, 42 persons being affected, of whom 14 died. Attention may be drawn also to an article by Lignières and Zábala,[1] who had observed in Argentina many outbreaks in fowls of a disease to which they gave the name "salmonellose aviaire," as its cause is a bacillus of the Gaertner group (the salmonellae). As outbreaks of this kind are associated with consumption of cream cakes and trifles, usually containing white of egg, it is not unreasonable to suppose, in the absence in any outbreak of evidence of a Gaertner "carrier" or other source of infection, that the Gaertner organism may at times be present in an infected egg, by means of which a foodstuff furnishing a suitable culture medium may become infected.

INDUSTRIAL HYGIENE.

It was announced recently in our columns (May 13th, p. 776) that the Industrial Hygiene Section of the International Labour Office of the League of Nations intended to publish bibliographical notes on industrial hygiene in the *International Labour Review*. The first of these bibliographies was issued with the May number of the *Review*. If they are continued on the same scale they should prove of great utility to everyone interested in industrial hygiene and allied subjects. Many of the papers and articles recorded were published in foreign periodicals which the average reader is not likely to consult unless his attention is specially called to them. To some of them, unfortunately, he would find it very difficult to obtain access in this country, but the fact that references are given to periodicals not at present subscribed for by British libraries will no doubt stimulate some of them to subscribe in the future. The literature is tabulated under several main headings, such as "Hygiene and Health in Trades and Occupations," "Hygiene and Health of the Worker," and "Industrial

[1] *Recueil de Médecine Vétérinaire*, 1905, vol. lxxxii, p. 453.

Physiology and Pathology," and each of these is split into smaller sections. Altogether 173 notices are tabulated in the May and June numbers of the *Review*, the largest number relating to the third of the headings mentioned. More interesting to the general reader than a mere bibliography is the series of articles and reviews on problems of industrial hygiene, which are published every month in the *Review*. In the June number, for instance, there is a lengthy summary of the Second Annual Report of the Industrial Fatigue Research Board, and other reviews. Special attention is paid to the subject of vocational guidance, and we learn that institutes dealing with this problem have been started in Spain, Switzerland, Germany, and other countries, with Government assistance. In Czecho-Slovakia the Central Bureau has organized a number of propaganda conferences, and collected data from workers and manufacturers relating to various occupations; many personal visits also were paid by the Council of Management to the workshops. A vocational guidance office has been set up, where the adviser talks over the chosen occupation with the child and his parents, and extracts information about the child's tastes and character. After a free medical examination and psychological test at the Labour Academy, the adviser is in a position to approve the child's choice or to suggest an alternative. In our own country the state of public opinion has not advanced so rapidly as it might, and vocational guidance has not yet received the official support it deserves. Fortunately, an unofficial undertaking, the National Institute of Industrial Psychology, has been founded by the co-operation of a number of employers and psychologists interested in the subject, and the work already done by the institute, as described in its *Journal*, is full of encouragement for the future. A summary of the work and aims of the institute is given in the *Review*.

THE SPA PHYSICIAN IN FRANCE.

PROBABLY many members of the profession who suffer from bronchitis or other conditions aggravated by the English winter climate have thought it would be agreeable to practise in a watering place in the south of France, for many of these are admirably situated in regions of lake and mountain or on the shores of the Mediterranean. The difficulty, however, of obtaining authorization to practise in France is virtually insurmountable; it is necessary to hold a French university diploma conferring the right to practise, and it is to be noted that not all degrees granted by universities in France confer this right. A correspondent who had not to encounter this difficulty, since in his youth, by a stroke of luck, he had taken a degree at the time when protection was not so strict, had only to register his diploma at the prefecture of the department in which he wished to practise; nevertheless, it was not quite plain sailing even for him. Like others, he intended to choose a place frequented by English and Americans, feeling justified in assuming that an Englishman or Englishwoman would prefer an English medical adviser if one were available. With Americans, he says, the attraction of an English-speaking doctor does not seem to be very strong, for if they do not find one of their own nationality they often seem to prefer to consult a French doctor. Our correspondent goes on to relate some of his early troubles. "The place I selected after carefully pondering over the matter was," he says, "renowned for its hot springs and the very elaborate methods of applying these waters for the relief of human suffering. I had letters of introduction to sundry of my future colleagues, but as soon as I announced my intention of settling down among them, though still polite and even cordial, they persistently evaded my questions as to the uses of the waters and the methods of treatment in vogue. Of course I diligently read up all that had been published and advertised about the place, and a time came when I began to see as through a glass darkly. Then, too, I made the acquaintance of the dean of the local faculty—that is to say, the oldest among them, and also the most large-hearted, for he happened to be a man who ought to have been a professor in a teaching centre; in other words, he derived pleasure from imparting knowledge. In pleasing contrast to his colleagues, he displayed the greatest readiness to initiate me into the mysteries of the balneological art, so that theoretically, at any rate, I soon acquired a sound foundation. But, as every practitioner of experience is aware, there are special qualities that make for success in practice quite independent of mere technical knowledge, and this is particularly the case in spa practice, where patients are not imbued with the confidence that comes of years of acquaintanceship. The patient knows nothing of you except that you have been recommended to him by his doctor in Paris or London, and he preserves an open mind. You have to find out how much attention the individual patient requires or desires—for the two are not synonymous; some patients can assimilate a lot of professional advice, others are less tolerant, and would dispense with it altogether if they only knew how. If written instructions for the baths are given, some patients pass them on to their friends, irrespective of their condition, or themselves use them in the following year, without reflecting that the condition of their health may have changed. There are a thousand and one little, but not insignificant, details to master in connexion with the Établissement des Bains; for instance, to secure punctuality of the porters and the proper execution of one's prescription by the *doucheurs* are not always easy matters, inasmuch as they have ideas of their own on the subject. It is necessary also to see that the patient is provided with the proper garments and takes an adequate rest after the baths, and so on. Such knowledge can only be gained in actual practice. Once it has been acquired it is seen to be simple enough. There are not fifty ways of taking a bath or a douche, and massage cannot be modified *ad infinitum*."

HEALTH OF EUROPEAN OFFICIALS IN WEST AFRICA.

IN the annual report[1] for 1921 on the vital statistics of non-native officials in West Africa, issued recently by the Crown Agents for the Colonies, it is stated that not only has there been a considerable improvement in the death and invaliding rates as compared with those for 1920, but that the former is almost the same and the latter less than the similar rates for the last complete pre-war year, 1913. The death rate reached the third lowest figure on record, being surpassed only by the years 1913 and 1916, while the invaliding rate was the second lowest on record, the year 1917 alone being lower. The reversion to normal conditions in West Africa was generally complete in the year under review, and comparison may once more fairly be made with the records of the pre-war years. The death rate has fallen from 16.3 per 1,000 in 1920 to 12 per 1,000 in 1921, a decrease of 4.3 per 1,000. This improvement is due to a great extent to the excellent figures for Nigeria, where the death rate is only 8.4 per 1,000, as against a rate of 20 per 1,000 for the Gold Coast. Thirty-seven deaths took place during the year; the chief causes of death were blackwater fever (7 cases), malaria, pneumonia, and heart disease. The invaliding rate is 16.6 per 1,000; this rate has shown practically a continuous improvement ever since the statistics were first compiled, and is now only a quarter of that recorded seventeen years ago. The number of non-native officials in the service on January 1st, 1921, was 2,875, 48 being in Gambia, 228 in Sierra Leone, 852 in the Gold Coast, and 1,747 in Nigeria.

CARNEGIE AWARD TO A MEDICAL MAN.

THE Carnegie Hero Fund trustees have awarded a medallion and an annuity of £130 to Dr. John Spence of Edinburgh, in recognition of his valuable and heroic work in radiology. Dr. Spence was among the first in Scotland to take up research in *x* rays and medical electricity, and as a result of radiological experiments he sustained serious damage to both hands, necessitating amputation of the right forearm. Dr. Spence is still carrying on his work as radiologist at Leith Hospital and Craigleith Hospital, Edinburgh.

[1] *West Africa Vital Statistics of Non-native Officials. Returns for 1921.* London: Crown Agents for the Colonies, 4, Millbank. Price 6d.

ENCEPHALITIS LETHARGICA.

Ministry of Health Report.

The Ministry of Health is shortly issuing as one of its Reports on Public Health and Medical Subjects a report on encephalitis lethargica, a copy of which we have been privileged to see. Amongst the enormous mass of literature on the subject this report should be destined to take a high place. It is a work wherein the neurologist, the general practitioner, and the medical officer of health may all find a profitable study.

Sir George Newman in his introduction explains the scope of the inquiry and summarizes the most important conclusions reached. We may be allowed to concur entirely with his statement that "it is probable that this report will prove of greatest value as a storehouse of statistical information, and in the large number of pages devoted to the appendices is safely garnered a wealth of facts and figures such as I do not think have been collected in any other similar report."

Dr. Allan Parsons is responsible for the greater part of the report itself, and he has dealt in a lucid and comprehensive manner with the immense mass of material at his disposal. After a brief introduction to the disease as it first appeared in this country he describes the method of inquiry which was pursued, and we are able to deduce the amount of painstaking study involved. The epidemiology and etiology are next considered, many statistical charts and tables being incorporated, which add very much to the value of the text. The possible relationships of influenza and poliomyelitis to encephalitis lethargica are fully discussed, as well as the interesting condition of "epidemic hiccough," of which some particularly valuable clinical and epidemiological details are given. The important practical questions of infection and contagion are well considered, as well as the problem of the possible carrier. The general opinion regarding the low infectivity of the disease as a whole emerges confirmed from the statistical inquiries on this aspect of the disease. One interesting and probably little known event which is noticed is the transmission of the disease from the mother to the newly born child.

The description of the clinical varieties of the disease is excellent and abounds in descriptive details. An anatomical classification of types is adopted, following the previous work of MacNalty, though the author gratefully mentions the work of Walshe in the classification of the purely nervous symptoms into positive and negative symptoms. Each of the various symptoms is considered in detail, both in what is called the "prodromal period" and in the "declared disease," albeit such an arbitrary division into distinct stages is hardly to be maintained. Tables of the frequency of the different symptoms are given, and altogether this section of the report is full of very valuable information. We think that the importance and frequency of the so-called Parkinsonian syndrome have been scarcely emphasized enough, while the reported frequency of facial, and especially double facial, paralysis leads to the doubt whether this symptom has not been erroneously interpreted as such, it being in reality often but an expression of the rigidity of the facial muscles in these Parkinsonian cases.

The course, complications, and mortality next receive consideration. Most observers will agree with the remark that "the case mortality rate of 48.3 per cent. as derived from the notification figures for 1919 and 1920 must certainly not be taken as a true estimate of the proportion of deaths that occur among people attacked by encephalitis lethargica." For there is no doubt that at this period many slight cases escaped recognition.

We are glad to see that the highly important question of the sequelae is considered and that some details in this respect are given in a very large number of cases in one of the appendices. In the matter of diagnosis it is shown that the conditions in which confusion is most likely to arise are tuberculous meningitis, cerebral tumours, and cerebral haemorrhage; to these it would be well to add syphilitic disease of the nervous system. The importance of the examination of the cerebro-spinal fluid is insisted upon, and this method of examination receives further consideration in a later section. The author wisely advises caution in prognosis, and we are here entirely in agreement with him, especially in regard to the eventually complete recovery or otherwise. The only branch of the symptomatology to which we would wish that more attention had been devoted is the mental changes which not infrequently occur, and in respect of which much more information is needed.

Dr. MacNalty contributes the section on the pathological anatomy and the experimental work on the transmission of the disease to animals. The morbid anatomy as studied by many different observers is carefully summarized. According to Mackintosh the lesion is definitely inflammatory, and the changes consist of a cellular infiltration of the perivascular lymphatic sheaths and of certain areas of grey matter. Changes in the meninges are slight. In the brain the changes are most conspicuous in the pons and in the basal nuclei. Compared with acute poliomyelitis the amount of neuronophagia is small. The occurrence of the "minute bodies" described by Da Fano and Ingleby is mentioned and their significance discussed.

On the bacteriological side opinion is now unanimous in favour of the view that the virus is a filtrable one. The work of previous observers is described, and this is followed by a full description of the interesting experimental work of Mackintosh arising from the outbreak of encephalitis at Derby in 1919. This observer was the first to be successful in transmitting the disease to animals. A useful table of the points of distinction on pathological grounds between encephalitis lethargica and acute poliomyelitis is given. The conclusion is reached that on pathological grounds the separate identity of encephalitis lethargica is amply proven. A summary of the more recent experimental work of Levaditi, Harvier, and Nicolau is given. These authors have emphasized the presence of healthy carriers of the disease, and have further found that the virus of herpes zoster is of the same nature as that of encephalitis.

The changes in the cerebro-spinal fluid are the subject of a separate report by Dr. Perdrau. This chapter will interest the clinician as well as the pathologist, for the former is often dependent on the report of the findings in the cerebro-spinal fluid to confirm or rebut his clinical diagnosis. Dr. Perdrau concludes that during the acute stages of the disease the following are the chief points to be noticed in the examination of the fluid: (1) a pleocytosis which varies in direct ratio with the severity of the disease; (2) a small increase in the total protein content, the latter not keeping pace with the former (dissociation cyto-albuminique); (3) the cells present are lymphocytes. In the subacute or chronic stage the fluid is practically normal.

Another useful table of comparison is here given, contrasting the changes in the cerebro-spinal fluid in tuberculous meningitis and encephalitis lethargica. A report of further recent experimental work follows, out of which one of the most important results which emerges is the production of an artificial immunity in rabbits by vaccination with the living virus.

We have here attempted only to summarize very briefly the highly interesting contents of this valuable report, but some further comment is made elsewhere in a leading article (p. 649). In conclusion, a special word of praise must be given to the appendices, where may be found a wealth of statistical detail, which will repay careful study. We hardly remember to have seen anywhere a bibliography so complete or one better presented. The index maintains the high standard of the rest of the work. We hope that this short account of a very lengthy report will stimulate readers to investigate it more thoroughly for themselves. The medical profession in this country is under a debt of gratitude to the Ministry of Health for the production of a report which is indeed a worthy monument to the labours of all concerned.

THE MEDICAL SICKNESS, ANNUITY, AND LIFE ASSURANCE SOCIETY.

The annual general meeting of the Medical Sickness, Annuity, and Life Assurance Society was held at the offices of the company, 300, High Holborn, on October 2nd, when Dr. F. J. Allan was in the chair.

Chairman's Address.

Dr. Allan said that the report sent out last year was for a period of thirteen months, while that before the meeting was for twelve months, so that there might be a little difficulty in comparing the figures. In both the sickness and the life assurance branches business had been well maintained. The report of the Registrar-General showed that the year 1921 was characterized by a remarkably low death rate,

and that was reflected in the claims for sickness, which were considerably below expectation. There had been rather a large number of accidents from motors, some of them due to starting. In the life insurance section a sound business was steadily being built up. It was necessarily slow work, as it took time for the profession to know that the company was open to transact life assurances up to any amount at particularly low premiums. A number of their members had taken out additional policies with the company, but many medical men were precluded from taking out further life assurances as they were already insured up to their limit. He, however, looked forward to increased business from those who were not insured, and from the younger members of the profession. A branch of insurance which seemed to him to appeal to medical men was the partnership insurance; at the death of a partner the surviving practitioner might be called upon to pay for the share of a practice, and it would be a distinct asset to have an insurance to meet such a claim. One of the advantages the Society offered was that while the premiums were practically equal to the non-profit rates of other companies they were able to recommend the distribution of a bonus. The Society's rates were, he understood, regarded in the insurance world as a notable achievement. They were able to quote low rates because the company was run on mutual principles with no shareholders, no commissions to agents, and strict economy in management. The number of annuitants showed a slight increase; the amount paid to them during the year was £5,000. Those members who in the past paid small premiums to ensure an income on attaining the age of 65 had made a good investment. As an example he quoted one member who had died recently at the age of 87; he had paid in less than £300 and had received a pension of £50 a year for twenty-two years. The management expenses showed an increase, but when discussing the conversion of the Society into a limited company he had explained that the expenses would be greater, especially in the first few years when the company was establishing itself on its new basis, inasmuch as it had to pay directors' fees, etc.; in addition it had been handicapped by increased prices. The directors were, however, satisfied that the expenditure incurred was not excessive. The management expenses on the Sickness and Accident Fund amounted to 15.8 per cent. of the premium income; on the Life Insurance Fund, which included annuities, it was only 8.1 per cent. A standing Finance Committee had been appointed, which had made a close examination of the accounts for a number of years. He looked with confidence to increased prosperity in the Society's work. He moved that the directors' report and the audited balance sheet be received. The motion was carried.

Valuation Report.

The election of three directors and the appointment of auditors for the ensuing year having been duly carried, the CHAIRMAN presented the valuation report prepared by the actuary, Mr. S. G. Warner, F.I.A. The surplus in the life department was not large, as Mr. Warner had valued the net premiums only on what were really non-profit rates. It was therefore, he considered, satisfactory to be in a position to recommend a bonus on the various classes of policies. In the sickness department a substantial surplus of £39,641 was shown, and the directors agreed with the actuary that a proportion of that sum should be returned to the insured. They thought the fairest way would be to give a rebate or reduction of the premiums falling due after the date of that meeting, such rebate being in proportion to the number of years of insurance. Any member who preferred to do so could allow the sum due to him to remain in the hands of the Society to be paid to the member on the termination of the period for which he was insured against sickness and accident. Some disappointment had been felt by members who attained the age of 65 after January 1st, 1919, because on the advice of the actuary no bonus was paid to them on their retirement. Dr. Allan then expressed the hope that, if it was found permissible to issue a bonus at the present valuation, it would be made retrospective. The directors therefore recommended that to those members who attained the age of 65 since January 1st, 1919, and whose insurances had consequently terminated, a cash bonus be paid equal to the full annual premium payable for such insurance during the year prior to its termination. They also recommended that from the surplus in the Sickness Fund £2,000 should be placed to the Staff Pension Fund. The chairman concluded his address by moving that the actuary's report and the recommendations of the directors be received. This was duly carried.

Mr. P. S. CAMPKIN, speaking as a former member of the Committee of Management prior to the Society being converted into a company, said that the members and the directors ought to be congratulated on the excellent position of the company. He considered that the amount of remuneration paid to the directors was insufficient, and moved that it be increased to three guineas a meeting to each director present, and four guineas for the chairman. The motion, having been duly seconded, was adopted. On the motion of Dr. VINRACE, seconded by Sir WILLIAM WILLCOX, a vote of condolence was directed to be sent to Mrs. Brindley-James on the death of her husband. Dr. KNOWSLEY SIBLEY moved a vote of thanks to the chairman for the enormous amount of work he did for the Society, and this was carried unanimously.

OPENING OF THE WINTER SESSION.

MEDICAL EDUCATION, PAST AND PRESENT.

SIR CLIFFORD ALLBUTT'S INAUGURAL ADDRESS AT ST. GEORGE'S.

THE inaugural address at St. George's Hospital Medical School was delivered on October 2nd by Sir Clifford Allbutt.

Sir Clifford Allbutt spoke first of his joy on returning to his old school. He was determined to come, even if this service, as a cynic remarked, took the repulsive form of a duty. He detected in himself one note of age—a disposition to recall the past, if not to dwell upon it. He remembered his own early appearance in the school, a well-intentioned but crude and rudimentary youth. In those days life was far too easy, and competition not keen. In medicine university men were few, and if fairly efficient a consulting practice fell to them without any great exertions in research or specialized study. The men who came to St.George's from Oxford and Cambridge were not supposed to compete with ordinary students for resident posts, nor even for prizes, but clinical clerkships were not grudged them. He served as clinical clerk under two physicians, one of whom, Fuller, he described as gentle fertilizing rain, and the other, Bence Jones, as sheet lightning. From Fuller he learnt much in an empirical fashion. He remembered how, after a thorough examination of the patient, Fuller would draw out a handsome gold pen, dip it cautiously in the ink, and write in a fine hand an imposing prescription for a mixture, as well as directions for a universal pill, for dieting, and for alcohol. Every patient at St. George's at that time had alcohol—some had brandy, others who were convalescent had ale, but there was nothing so vulgar as whisky. Fuller was not a genius, but a kindly, competent, and diligent man. Bence Jones was a fascinating and brilliant personality. He was invariably unpunctual, and the speaker recalled him now, coming up the stairs two or three at a time, with the morning guineas, it was said, scattering out of his pockets as he flew. He would ask which were the worst patients, snatch the poor notes of his clerk, make a rapid diagnosis, and as rapidly scratch in some prescription. Extravagant and whimsical as was this man, it was a sharp and inspiring discipline to be associated with him. Of the surgeons at that time Sir Clifford Allbutt could say nothing. He hardly ever entered the surgical ward. This curious division between medicine and surgery was a cramping convention handed down from the Middle Ages and a blight upon the profession for centuries until now. Sir Robert Jones had urged lately the need for a closer integration of medicine and surgery, and Sir Clifford believed that the old division must cease.

At the time to which his memories went back medicine was being reinforced and transformed by the vast developments of natural science. But before every revolution, beneficent as it might be, there must be some destruction of old concepts, the ground must be cleared of antiquated systems and forms, and they had to resign themselves to some permanent or at any rate long-persisting loss. The wistful retrospect of those who, nevertheless, were hoping for and working at the new order was not mere sentiment; and it might well be hoped that, as time went on, changes would not be so cataclysmic as in the past, so that they could better be foreseen and provided for. The conservors must be more sagacious, the reformers more patient. In therapeutics, for example, pharmacologists had done much to clear out of the way antiquated methods and remedies, and purify those which remained. Many combinations of remedies established on theories accepted for generations had slipped out of sight, and, it might be, were altogether forgotten. The harvest was multiplied a thousandfold, yet in the ingathering not a little was lost.

Professional Training.

The speaker then turned to the subject of the education of the student and repeated some of the remarks he had made in his article in the Educational Number of the BRITISH MEDICAL JOURNAL.* In professional education he laid stress upon the need for the interpenetration, interweaving, and mutual reinforcement of the sciences on which the art of medicine was founded. As Roger Bacon said nine centuries ago, all the sciences were bound up together and helped each other. The details of the various ancillary sciences they could not be expected to master, still less to remember, but of the main principles they must not be ignorant. They must ever bear in mind that a common cause might run through many groups of various phenomena. It might be that in course of time physiological problems would be capable of explanation and expression in terms of physics and chemistry. They must learn to regard diseases no longer as entities but as phases of biology. They must not think of their education in these sciences as a series of stages, each to be left behind as another was pursued, but rather as the ascent of a mountain, each part of the ascent contributing to the widening view. The teachers at that school would endeavour to lead the students farther along the lines of research. Could any subject seem on first acquaintance less profitable, yet how mighty had been the achievements! Even the Panama Canal depended upon the curiosity of Manson and Ross with regard to the guts of the mosquito. He counselled those who were studying medicine to undertake their reading alongside their practice, to study the clinical manuals as far as possible by the bedside, to select the appropriate chapters as chance patients came before them, and compare the clinical notes with the classic descriptions, always remembering, as Bateson said, to "cherish your exceptions." It was often said that in modern medicine instrumental diagnosis was supplanting the direct aid of the senses. While in some respects the eyes and the finger-tips might lose their cunning, he believed that on the whole the instruments stimulated and reinforced an acute observation. In practice, especially in general practice, they had often to go beyond their evidence. The practitioner, having gained a half intuitive insight and foresight, worked on what were called moral certainties, or, to express it differently, on commonsense. Without commonsense in practice they would lose their way again and again. Yet in science commonsense was a treacherous ally, and often in the long run failed them because it allowed to creep in an accumulation of small errors.

Psycho-analysis.

This led him to make some remarks on psychology, which would be better known as the physiology of the mind. The reiteration of the word "psychology" was getting wearisome. People spoke of the psychology of the crowd when they meant simply its temper. It almost seemed as though some writers on the subject really supposed that disorders of the mind were represented by no physical deviations within the substance of the brain. Popular psycho analysis was false science; it had no units, no means of measurement, no controls, no precise definitions, no separation of objective and subjective evidence. He was doubtful altogether of its virtue. Even pickpockets now were appealing to their judges to regard their cases from the psychological point of view. The method of science was to work on lower categories, and not to explain anything in terms of higher categories before the lower were explored. Psycho-analysis had been known for centuries in the Church as confession and casuistry, and the Roman Church had been well aware of its dangers. Yet, all this experience notwithstanding, it was now proposed that any teacher should be allowed to probe into the minds of adolescents and children, too often with dirty tools. It was false to argue that the soul need not be tainted with foul suggestion. To talk about such things as should not be known or named was to create familiarities which bred temptations. Suggestion did not consist in occasional jabs at the mind, but the mind was open incessantly to suggestion as the lungs to air. Was it unfair to say that the interpretations given by psycho-analysts to the dreams of our modern Jacobs and Daniels were incredible nonsense, worse than unsubstantial or extravagant? What was formulated as the subconscious could not contain more than the record of past—and, so far, inferior—experience. It was not possible to get out of a pint pot more than was put in.

* The Training of the Medical Student, September 2nd, 1922, p. 407.

The Rewards of the Doctor.

In conclusion, Sir Clifford Allbutt said that every profession had its hardships and its rewards, its rough places and its smooth, its joys and its drudgeries. But in medicine the trials and the blessings came close together. In all honest work there was ultimate good, but in medicine the harvest was gathered on the field almost at the sowing. The task of relieving suffering and restoring health afforded deep satisfactions, even if the patient was not always grateful; and such gratitude usually came eventually, though it might take other forms of expression than the obvious. Those engaged in medicine, in their contact with their patients, did well to cultivate a hopeful outlook. A successful physician once told him that he never left a house without giving a favourable prognosis. It was a counsel which had a colour of world wisdom; but he was right in this, that no one could foresee what benediction words of hope might bestow.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN.

The new session at the London School of Medicine for Women was opened on the afternoon of October 2nd, when a large company of old and new students met under the chairmanship of the Dean, Miss Louisa Aldrich-Blake, M.D., M.S., who extended a welcome to the fifty entrants and gave an account of the past year's work.

The introductory address was delivered by Viscount Burnham, who spoke of the progress made in the medical education of women during the forty-eight years since the school first opened, and during the forty-five years since its students began to study clinical medicine at the Royal Free Hospital. He reminded his hearers that they inherited the rights and privileges won for them by the efforts of the small band of great women who did pioneer work half a century ago. The inspired courage of women like Elizabeth Blackwell, Sophia Jex-Blake, and Elizabeth Garrett Anderson must never be forgotten. He recalled, in particular, the wonderful achievement of Dr. Garrett Anderson, whose son was to-day their honorary treasurer. The preventive movement in public health was in its infancy during the early days of her struggle for the recognition of women in the medical profession. In the great work of public hygiene women who were fully qualified ought to be employed more and more as their obvious appropriateness to many of its special subjects became clearer and more widely understood. He did not suggest that the branches of medical service should be separated into watertight compartments, but he felt that in the direction of the public health service women had an invitation and an inducement which was perhaps not so clear in all branches. Again, the more the scientific side of the medical profession was extended and developed the more favourable were the opportunities for women's work. This opened up a vista of employment and usefulness outside the ordinary range of medical practice, which, so far as his inquiries had gone, was for the present somewhat limited in the case of women to certain localities. He believed that so far the practice of women doctors had been almost entirely among women. In the future rearrangement of hospital work and the redistribution of organized help to the sick poor it seemed to him that women doctors would find a new occupation specially suited to their special gifts and faculties. In conclusion, Lord Burnham remarked that the new students were entering their profession at a critical time in its history. Efficiency, like co-ordination, had been ridiculed by the scoffer, but for all that they had to be efficient. The world would not accept them as efficient merely because they were women; neither men nor women would be accepted in future on their own valuation. Above all other qualities medical students needed the genius for taking pains and the ideal of human service. To them nothing should be common or unclean except slipshod methods, inaccurate observation, and dishonest pretence of understanding what they did not understand.

Dr. Mary Scharlieb, as President of the School, proposed a vote of thanks to Lord Burnham for his address. Thinking very seriously of the school the other day, she said, it had come to her more clearly than ever before that they were perhaps not pulling quite their own weight in the medical boat. Looking back over the last thirty-five years, it seemed to her that they had done very well as school students; but academic distinctions, though very nice, were after all but the shining pebbles and pretty shells. Of real importance

was what they were going to be after graduation. Was it not time, she asked, that one of their alumni wrote some epoch-making book or made some important discovery in the field of research? More important than all, ought they not to be foremost in the endeavour to lessen infantile mortality?

ST. BARTHOLOMEW'S HOSPITAL.

The annual Old Students' Dinner of St. Bartholomew's Hospital was held on October 2nd in the Edward VII Rooms, Hotel Victoria, with Sir Charles O'Brien Harding, J.P., M.R.C.S., of Eastbourne, in the chair. There was a large attendance. After the loyal toast had been honoured, the chairman, in proposing prosperity to St. Bartholomew's Hospital, observed that wherever one looked Bart.'s men were still leading the field; thus the presidents of the two Royal Colleges, the Regius Professor of Medicine at Oxford, and the Vice-Chancellor of the University of London were old students of St. Bartholomew's. The toast was responded to by Lord Stanmore, the new Treasurer, who spoke of the arrangements for the celebration next year of the octocentenary of the hospital and the efforts made to overcome financial difficulties. Sir William Lawrence, Bt., the Senior Almoner, in submitting the toast of "The Medical College," declared that medical education was the paramount function of the hospital. Mr. H. J. Waring, Vice-President of the College and Vice-Chancellor of the University of London, responded, and gave a brief outline of the year's doings. The number of students was now 750—probably the largest on record—and this had emphasized the need for an obstetrical teaching unit and for the new department of physiology. The question of admitting women students had been considered, but it was found impossible to make room for them. Remarking that the improvement of the hospital buildings had now gone as far as it could, Mr. Waring professed himself, like Sir William Lawrence, an antisentimentalist when it came to a question of preserving old stones or meeting new needs. The health of the visitors was proposed by Sir Thomas Horder, who classified them into "intimate strangers" and academic guests, and so managed to pay several amusing compliments. The Rev. E. C. Pearce, D.D., Vice-Chancellor of the University of Cambridge, and Sir William Thorburn, K.B.E., Emeritus Professor of Clinical Surgery in the University of Manchester, responded. Dr. Pearce said he had had a friendly feeling for St. Bartholomew's ever since as a Christ's Hospital boy (when the two institutions were next-door neighbours) he studied elementary chemistry under Russell, and now as Vice-Chancellor he was pleased to hear how many Bart.'s students still came from Cambridge. Sir William Thorburn expressed his admiration for the hold of St. Bartholomew's upon medical thought in this country and for its great services to the profession. The Chairman's health was proposed by Sir Anthony Bowlby, President of the Royal College of Surgeons, who said that the good name of Bart.'s depended on a well-guided and well-served hospital, on a finely equipped medical school, and on the zeal of its workers; but above all on the *esprit de corps* of its old students throughout the world. Their chairman that evening, Sir Charles Harding, was a representative general practitioner in whose hands the reputation of the hospital was safe.

CHARING CROSS HOSPITAL.

The presentation of the prizes at Charing Cross Hospital Medical School took place on the afternoon of October 3rd. In submitting his annual report for the academic year 1921–22 the Dean, Dr. W. J. Fenton, said that the position attained by the school during the war with regard to the number of students entering and the general progress which it showed had been fully maintained, and there was evidence of solid advance. The tendency to an increase in women medical students as compared with men noted in his last report had become less observable. During the last three or four years the entry of medical students had risen to a very high level, and, though it was early to draw conclusions, it seemed probable that a return to a more normal entry, both of men and women, was beginning to show itself. The question had been asked whether the school would continue to admit women students to its curriculum. The answer was that it would continue to do so. The principle of co-education was deliberately adopted some years ago after full discussion, and nothing had occurred in the interval to occasion regret that that course was taken or to require its modification. A glance at the prize list revealed the fact that the greater number of class prizes had been taken by women students. This should not be regarded as evidence of superiority or otherwise of one sex as compared with the other, but merely one of those periodical fluctuations which adjusted themselves to an average over a series of years. After referring to staff changes during the year Dr. Fenton thanked the teaching staff of the hospital and school for the work they had done and their untiring efforts on behalf of the students. He also thanked the Principal and the Professors of King's College, University of London, for their care and attention on behalf of Charing Cross students. The pass lists were an eloquent testimony to their good work. The association of the school with King's College in the earlier subjects of the medical curriculum had been most cordial, and after eleven years of concentration on the College for preliminary work he had to record nothing but success.

Viscount Burnham, having presented the prizes, congratulated the renowned school of Charing Cross Hospital on the successful report presented by the Dean and expressed his best wishes to the successful students. He considered them very fortunate to have an opportunity of studying in such a place and under such a staff. He recalled the great interest which his family had always taken in the welfare of Charing Cross Hospital. On the motion of Sir Herbert Waterhouse, seconded by Mr. Peter Daniel, a hearty vote of thanks was accorded to Lord Burnham.

The annual dinner of past and present students was held in the evening at the Imperial Restaurant, with Viscount Burnham in the chair. The toast of "The Hospital and Medical School" was given by Sir Herbert Waterhouse, who referred to the loss the school and hospital had sustained by the retirement of Mr. Stephen Fenwick. He mentioned that Mr. George Verity, chairman of the hospital, had become chairman of the medical school, and that the freehold of the school buildings had been purchased. The toast of "The Students, Past and Present," was given by Dr. W. C. Bosanquet and acknowledged by Dr. Scott for the old students and Mr. Clifford-Smith for the present students. The toast of "The Guests," given by Dr. David Forsyth in a humorous speech, was acknowledged by the Principal of King's College and Dr. Ingleby Oddie, coroner for Westminster. Mr. George Verity, in proposing a vote of thanks to the chairman, said that he hoped the project for a maternity ward would shortly be realized. Viscount Burnham, in his reply, spoke of the interest which through contiguity Fleet Street took in Charing Cross Hospital.

ST. MARY'S HOSPITAL.

The annual dinner of St. Mary's Hospital Medical School took place on October 2nd, when Sir Leonard Rogers, M.D., F.R.S., presided over a company of 140 past and present students. The chairman gave some reminiscences of his student days at the hospital; on one occasion he was a member of a raiding party, which in the dead of night obliterated the sign of an undertaker who advertised cheap funerals under the hospital windows. The speaker referred regretfully to the deaths of Professor Waller, Dr. Mitchell Bird (who had left about £10,000 to the hospital), and the librarian, Mr. Nanfan. Happy was the country which had no history, also the institution which did its work so quietly and effectively that there was very little to be said about it. Mr. A. R. Prideaux, Chairman of the Hospital Board, mentioned that recently a man who had been brought into the hospital badly injured in a street accident, so that his leg had to be amputated, was so grateful for what was done for him that on his discharge he organized a boxing tournament, which brought in £2,000 for the hospital; moreover, he promised to make it an annual event. Dr. C. M. Wilson, the dean of the school, gave an account of the school's income, which came, he said, from two sources—student fees and State contributions. To justify the continuance of the latter it was necessary to provide something distinctive at St. Mary's, which was not furnished by other schools. Therefore the clinical field had been widened by affiliation with Paddington Infirmary and Paddington Green Children's Hospital, and arrangements were contemplated with a lying-in hospital which would give the students access to a large number of midwifery beds. For those already qualified a number of scholarships and posts were instituted, so that a man who was keen upon pursuing his studies could "hang on." The post-graduate courses were very important, not merely to the graduates. By means of the criticisms and suggestions of graduates the school learned whether it was giving to students the actual equipment which they would need in practice. The entry to the school this

year was seventy-one; it had not diminished. Sir John Broadbent proposed the health of the chairman and told the story of his researches upon kala-azar, cholera, dysentery, and amoebic liver abscess. Sir Leonard Rogers, in reply, said that his choice of a profession was determined for him at a very early age. In his native Cornwall the seventh son of a seventh son was regarded as born to be a doctor; he was the seventh son of a sixth son, and that was regarded as near enough for the purpose. The only merit he could claim was that he refused all other work in order to stick to research, breaking with the tradition in India that a pathology post should be used as a stepping stone to lucrative clinical practice.

KING'S COLLEGE HOSPITAL.

The ninety-third winter session of King's College Hospital Medical School opened on October 3rd, when the ceremony at Denmark Hill was presided over by Viscount Hambleden, chairman of the board of management. In his introductory speech the chairman remarked on the great success of the past year, not only in work, but also in play. The enforced closing of some of the hospital wards, owing to shortage of funds, brought various disadvantages, including a considerable loss of clinical material for teaching purposes. A certain number of beds had, however, been opened for the treatment of patients who could contribute the whole cost of their maintenance, and he was glad to know that in the great majority of cases it had been possible to use these beds for teaching purposes. Although 160 beds had been closed, the number of in-patients had not gone down in proportion, because the number of days during which beds were occupied had been reduced. The dean of the medical school, Dr. H. Willoughby Lyle, in his annual report said that there were now 278 undergraduate students, of whom 98 were women.

The introductory address was given by Sir Herbert Jackson, K.B.E., F.R.S., Emeritus Professor of Chemistry in the University of London, who discussed in particular the place of science in education, and insisted on the importance of breadth in the early training of those who intended to follow the medical profession. The time, he thought, had come to consider seriously whether the specialization which had been getting more and more evident even in early education, and was now so pronounced in scientific teaching at the universities, was likely to produce the best result or to be the method by which a student of science at the present day could reap the best results from the work of his predecessors. It seemed necessary to encourage a much wider outlook by the student of science. Recent experience was in favour of decreasing the mass of detail to be accumulated by the student and increasing his opportunities for gaining a wide and sound foundation of knowledge. It was really not a contradiction in terms to say that the broader the earlier education in science as a whole the more complete specialization in any one branch could be made. Moreover, the inclusion of the subjects grouped together under the term "humanities" was vital in the education of one who, like a medical man, entered into intimate relations with his fellow creatures. The outlook on science changed so rapidly, and the applications came one after the other so quickly, that it seemed that a medical man needed a sounder and earlier study of general principles throughout the sciences.

MIDDLESEX HOSPITAL.

The opening of the eighty-eighth winter session of the Middlesex Hospital Medical School took place on October 3rd at Wigmore Hall. In the absence of Princess Alice the prizes were presented by the Earl of Athlone, chairman of the governing body of the hospital. The dean, Mr. A. E. Webb-Johnson, in his report for the past academic year, recorded several munificent gifts to the hospital and school, notably that by Sir William Veno, who had presented £10,000 for cancer research in the form of £1,000 a year for ten years. It had been decided to use this additional income for the development of research in biochemistry with a view to the solution of some of the chemical difficulties of the cancer problem. The financial support received during the past year had encouraged the authorities to make substantial additions to the accommodation in the medical school in order to enlarge the facilities for research.

The introductory address was delivered by Professor Sidney Russ, D.Sc., physicist to the hospital, who devoted a large part of his discourse to the life-work of two English pioneers in scientific research—William Gilbert and Thomas Young. He reminded his audience that, besides their epoch-making discoveries in physics, both men were successful in the profession of medicine, Gilbert being President of the College of Physicians and Young a Fellow of the College and a physician to St. George's Hospital. Professor Russ feared that there was a disposition nowadays to think of modern discoveries as outstripping in importance those that had preceded them. Pioneers like Gilbert and Young had not only to search out the secrets of nature but to combat the opposition of the pseudo-science of their day; for that reason their work would always be highly appraised.

The annual dinner of the Medical School was held at the Trocadero Restaurant, with Mr. W. Sampson Handley in the chair. There was a very large company, including many old students. The chairman, in proposing prosperity to the hospital and school, spoke of the excellent progress made in various directions, and declared that the prospect had never been brighter. The toast was replied to by Mr. S. G. Asher, chairman of the school council, who insisted that the hospital and school were one; medical education, research work, and the training of nurses were as much the functions of a hospital like the Middlesex as the actual treatment of the sick. Mr. A. E. Webb-Johnson, who also responded, remarked on the large number of entries this year, and the high proportion of students from Cambridge.

WESTMINSTER HOSPITAL.

The winter session of the Westminster Hospital School of Medicine opened on October 2nd, when Mr. G. T. Mullally, assistant surgeon to the hospital, gave an address on "The art of medicine." The ceremony, which took place in the board room, was presided over by Mr. Walter G. Spencer, senior surgeon, who in the course of a brief sketch of the history of the hospital remarked that it was founded in the days when no such thing as a medical school existed in England. A report of the year's work and successes was presented by the dean, Dr. A. S. Woodwark. In his address Mr. Mullally insisted that however scientific medicine might become in the future its practice would always remain an art. Contact with the individual patient was the most important element in clinical studies. The student would soon learn that there was no certainty in medicine—that the practitioner was guided chiefly by the accumulated observations of his predecessors. In medicine there was no final court of appeal; each of them must solve his problems as best he could. It was the human, or perhaps, better still, the living, element which provided at once the difficulty and the charm of medicine. The art of medicine was the choice of the remedies and methods best suited to the individual patient. The patient in feeling that his illness was different from other illnesses was right; thorough realization of that fact was the first principle in the successful practice of medicine. The patients in that hospital kept their names and were not known by numbers; thus they kept their individuality and were the gainers thereby. One of the great dangers in the setting up of a national medical service was that the independent doctor might become an official and the individual patient merely a statistical unit: the art of medicine could not be practised upon units.

The annual dinner of the past and present students of Westminster Hospital was held at the Wharncliffe Rooms, Great Central Hotel, on Monday, October 2nd. Ninety-one were present, the guests including Sir Edward Pearson, the chairman of the hospital, Mr. C. M. Power, secretary of the hospital, the Rev. Dr. Hillard, highmaster of St. Paul's School, and Mr. Arnold Powell, headmaster of Epsom College. The toast, "The Hospital and Medical School," was given by the chairman, Mr. Arthur Evans, and responded to by the dean of the medical school, Dr. A. S. Woodwark, who described the steady progress in the number of students (the present entry being the highest for fifteen years) and the large number of academical successes. Mr. Walter Spencer proposed "Past and Present Students," in response to which Mr. Rock Carling and Mr. Wilson spoke. Sir James Purves-Stewart gave the toast, "The Visitors," coupled with the names of the highmaster of St. Paul's and the headmaster of Epsom College, both of whom in their replies referred to the long and honourable association of their respective schools with Westminster Hospital. "The Chairman" was given by Sir H. Bryan Donkin, the senior consulting physician.

Scotland.

DIPHTHERIA PREVENTION IN ABERDEEN.

PROFESSOR MATTHEW HAY, medical officer of health for Aberdeen, has submitted a report to the public health committee of Aberdeen Town Council, strongly urging the use of toxin-antitoxin for the prevention of diphtheria. Professor Hay pointed out that during the last few years an extensive trial had been made, more especially in New York, of the method by which small doses of a special diphtheria toxin-antitoxin were used, which, though not producing the full immunizing effect at once, conferred complete protection for many years, and in all probability for a period equal at least in duration to the whole period of childhood. He stated that at the City Hospital, Aberdeen, he had already been using this new method for almost two years for the protection of the staff, with entirely satisfactory results. In New York many thousands of school children had been treated by it without the occurrence of any cases of diphtheria in a child in whom immunization had been properly carried out. Professor Hay suggested that the health department should be authorized, in connexion more especially with mother and child welfare work, and at the City Hospital, to offer gratuitously the toxin-antitoxin treatment against diphtheria on the understanding that it would not be carried out in any case without informing the regular medical attendant of the family and obtaining his acquiescence. No compulsion would in any case be attempted, but an endeavour would be made in the instruction given to mothers at welfare centres and elsewhere to persuade them of the advantages of the treatment.

THE CENSUS OF SCOTLAND, 1921.

County of Ayr.

Continuing the publication of the county census reports in alphabetical order, and following those of Aberdeenshire and Argyllshire noticed in our issue of September 9th (p. 487), the reports on the counties of Ayr[1] and Banff[1] have now been issued. Omitting from calculation the four great towns of Scotland, Ayrshire stands next in population to Lanarkshire. At the census day it had 299,273 inhabitants. But the delay of the census from April to June has appreciably affected the figures for Ayrshire, just as it has those of Argyllshire. The towns on its long coastline from north to south—Largs, Ardrossan, Saltcoats, Irvine, Troon, Prestwick, Ayr, and Girvan—are favourite summer health resorts, the sand dunes along the shore providing many miles of almost contiguous golf courses, some of whose names are of world-wide familiarity to golfers. One incidental result of the change of census date is that Ayr, the county town on the coast, is now shown with a slightly larger population than the inland town of Kilmarnock, which has always hitherto stood first. The Ayr burgh population is shown as 35,763, as against Kilmarnock's 35,747, a difference of 16. The county has shown a steady decennial increase in inhabitants ever since the first census of 1801, when the population was 84,207, so that now it is fully three and a half times as large. Sixteen burghs have 56 per cent. of the population, the non-burghal areas having 44 per cent. The area of the county is 724,251 acres, giving an average of 41 persons per 100 acres. In the burghal portion the average is 1,420, and in the non-burghal 19. Of the burghs, Saltcoats had (in June) 2,905 persons per 100 acres, Kilmarnock 2,799, Galston 2,606, and Largs 2,124. The lowest averages were in some of the parishes of the Carrick, or southern, non-industrial district of the county.

Sex and Age.—The ratio of females to males was 109.3 to 100, as against 106.1 to 100 in 1911, the relatively high increase of females being probably associated with influx of summer visitors. The increase in population is almost entirely over 15 years of age. The average age of males is 27.9, and of females 29.3, as against 26.4 and 27.7 in 1911. Of children under 15, 89.3 per cent. had both parents alive, 6.6 had mother alive but father dead, 2.9 had father alive but mother dead, and 0.6 per cent. had both parents dead. Of males aged 15 and over 41.8 per cent. were single, 53 per cent. married, and 5.2 per cent. widowed. The corresponding figures for females are 41.6, 47.8, and 10.6 per cent.

Housing.—The number of persons per 100 windowed rooms was 156, as against 150 in 1911, but this is doubtless owing to summer visitors, as the ratio had steadily improved from 1861 onwards. In that year it was 208; in 1871, 190; in 1881, 178; in 1891, 166; and in 1901, 157. The total burghal ratio is 156, the same as for the county; but Galston has 190, Kilwinning 185, Kilmarnock 175, and Irvine 173. Of the total population, 9.3 per cent. lived in one-roomed houses, 41.5 per cent. in two-roomed, 18.6 per cent. in three-roomed, 9.4 per cent. in four-roomed, 5.4 per cent. in five-roomed, and 4.4 per cent. in six-roomed.

Occupations.—Of the population 12 years old and upwards, 58.9 per cent. had remunerative occupations. The principal, stated as a percentage of the total persons in occupation, were: Mines and quarries, 12.6 per cent.; metals, 11.6 per cent.; commerce (clerks excluded), 9.5 per cent.; agriculture, 9.4 per cent.; personal service, 8.9 per cent.; textiles, 7.7 per cent.; transport and communication, 7.2 per cent. Professional occupations (excluding clerks) were 3.7 per cent.

[1] Vol. i, Parts 7 and 8, of Census of Scotland, 1921. H.M. Stationery Office, 23, Forth Street, Edinburgh. 10s. 2½d. and 6s. 2d. respectively, post free.

County of Banff.

The population of this county on the Moray Firth was 57,298, a decrease of 6.7 per cent. since 1911. The county reached its decennial maximum of 64,190 in 1891, having grown steadily from 37,216 in 1801. Of the total population 53.2 per cent. is burghal and 46.8 non-burghal. There are eleven burghs, of which the largest is Buckie with 8,690 inhabitants, and the smallest Dufftown with 1,454. All the burghs have lost population since 1911, and so also have both of the two county districts and every one of 22 parishes. The county area is 403,053 acres, and the average number of persons per 100 acres is 14. The burghal average is 814 and the non-burghal 7. The most sparsely populated parishes are Cabrach and Kirkmichael, each with one person per 100 acres.

Sex and Age.—The proportion of females to males is 109.3 to 100, against 106.4 to 100 in 1911. The average age of males is 28.9 years, and of females 31, against 27.5 and 29.4 in 1911. Of 18,705 children under 15, 85.2 per cent. had both parents alive, 11.6 per cent. had lost one parent, and 2 per cent. had lost both. Of the male population aged 15 and upwards 42.5 per cent. were single, 51.5 married, and 6 widowed or divorced. The corresponding figures for females were 40.5, 47.2, and 12.3 per cent., the number divorced being 7.

Housing.—The average number of persons per house was 4.6. The average number of persons per 100 windowed rooms was 108, as against 165 in 1861, 154 in 1871, 138 in 1881, 128 in 1891, 119 in 1901, and 114 in 1911, showing a steady and satisfactory decrease in room density. The percentage of population living in one-roomed houses was 1.8, in two-roomed 14.7, in three-roomed 22.9, in four-roomed 18.7, in five-roomed 14.9, and in six-roomed 8.9. Only 258 persons in the county can speak Gaelic.

Occupations.—Of the population 12 years and upwards 54.3 per cent. were in remunerative occupations, the principal, stated as a percentage of the total persons in occupations, being—agriculture 26.6, fishermen 13.8, personal service 13, commerce (excluding clerks) 7.4, transport and communication 6.8. Professional occupations (excluding clerks) were 4 per cent.

County of Berwick.

Among the most recent sections of the Census of Scotland, 1921, is that dealing with the border county of Berwick.[2] It had a population of 28,246 on census day, being a decrease of 1,397, or 4.7 per cent., since 1911. The population steadily increased from 1801 to 1861, when it reached 36,613, but since then has steadily decreased, being now 22.9 per cent. less than the maximum. Of the total population only 22.7 is burghal, and the four burghs are little more than villages, the largest being the fishing town of Eyemouth with 2,477 inhabitants, and the smallest Lauder with 759. Duns, with a population of 1,868, is the capital of the county, the town of Berwick-on-Tweed being uniquely regarded, since the union of England and Scotland, as neither in the one country nor the other, though municipally it is English, with a mayor and aldermen instead of a provost and bailies. The area of the county is 292,535 acres, giving an average of 10 persons per 100 acres. The proportion of females to males is 110.1 to 100, against 108.9 to 100 in 1911. The average age of males is 32.4 years, and of females 34 years, as against 30.3 and 32.1 in 1911, showing an average increase of two years. Of males 15 years and over, 40.8 per cent. were single, 51.9 per cent. married, and 7.3 per cent. widowed or divorced. The corresponding figures for females were 43.5, 46.0, and 10.5 per cent.

The average number of persons per house was 4, against 4.2 in 1911. The ratio of persons per 100 windowed rooms was 101. In 1861 it was 165; in 1871, 147; in 1881, 133; in 1891, 118; in 1901, 113; in 1911, 103; and now 101. Of the total population, 3.3 per cent. lived in one-roomed houses, 29.3 in two-roomed, 22 in three-roomed, 16.8 in four-roomed, 7.1 in five-roomed, and 4.9 per cent. in six-roomed. Of the population of 12 years and upwards, 92.1 per cent. of males and 29.5 per cent. of females were in remunerative occupations, the principal, stated as a percentage of total occupations, being—agriculture 39.5 per cent., personal service 11.3, commerce (clerks excluded) 6.5, transport and communication 6, and fishermen 4.4 per cent.

[2] Vol. i, Part 9, of Census of Scotland, 1921. H.M. Stationery Office, Edinburgh. 4s. 6d. net.

THE CALEDONIAN MEDICAL SOCIETY.

The Caledonian Medical Society held its annual dinner this year in London. It took place on September 29th at the Hotel Cecil, and the President, Dr. John Matheson of Islington, was in the chair. Sir James Cantlie gave the toast of "Caledonia" in a doric not wholly intelligible to some of the guests, and incidentally alleged that the language of Chaucer was still spoken in Teviotdale. He asserted that the Scots and the Swiss were the only peoples to suffer from nostalgia, and maintained that the cure of that complaint was effected by joining together in societies, of which the Caledonian Medical Society was an example. The Society had the widest circle of any medical body in the kingdom, and therein it was significant of the Scot, whose name came from *scuite*, a wanderer. The Rev. Alexander Macrae proposed the toast of the Society, and was forthwith elected an honorary member. He told how it fell to the lot of the parson to fortify the doctor's advice, and occasionally to sympathize with the patient against it. The President, in responding, said that the medical profession everywhere was a vast freemasonry, to which the Caledonian Medical Society contributed its share. Its numbers were small, but its geographical distribution was as wide as the world, and thus it was a microcosm of the Scottish nation. The health of the guests was entrusted to Sir John Collie, who told some Scottish stories. Sir Donald Maclean, M.P., in acknowledging the compliment, said that in recent years the medical profession had made greater strides in its development and outlook than any other learned profession, and the well-being of civilized communities and the uplifting of communities not civilized depended in a major degree on the devotion and scientific mind of the doctor. On that account it was increasingly necessary that the government of all countries should see that the medical profession was thoroughly well equipped for its fight against disease. When he had been asked recently to name the most useful classes in the community he replied, "Doctors, policemen, and ministers, and in that order." He did not know that adequate record had been made of the services of the medical profession in the war. There the medical men shirked nothing, and through all the horrors and excitements carried the calmness of the scientist and the sympathy of the Samaritan. He trusted that circumstances would not arise to make such a call upon the profession necessary again. Sir Dawson Williams, who also responded, said that in his calling he always found it a great satisfaction to deal with a Scotsman because the Scotsman was commonly something of a philosopher, and, despite all that was said to the contrary, had usually a keen sense of humour. The gathering broke up after honouring the President, on the motion of Dr. G. C. Anderson, who said that Dr. Matheson's forty years in London had not obscured one of the natural characteristics of the Scotsman. Dr. Matheson replied by saying how much the society was indebted to Dr. Anderson and Dr. Campbell McClure for the success of the occasion.

ANDERSON COLLEGE OF MEDICINE.

The vacancies on the teaching staff of the Anderson College of Medicine, Glasgow, to which we made reference in our issue of September 23rd, have now been filled. Dr. James H. Martin has been appointed to the chair of midwifery and diseases of women, and Dr. George B. Brand to the lectureship on diseases of the throat and nose. At their meeting the Governors resolved to invite the late Dean of the Medical Faculty, Dr. John Macintyre, to join the board on his resignation after thirty-one years' service on the teaching staff of the College.

England and Wales.

AN ORTHOPAEDIC SPORTS MEETING.

A SPORTS meeting of more than ordinary interest was held at Grangethorpe Hospital, Manchester, on September 15th, when limbless men demonstrated how it was possible to overcome the handicap of a missing limb and to participate in sports. The meeting was organized by Dr. F. A. Hort, medical superintendent of the hospital, and among the entrants were a number of men who are members of the North of England Limbless Sporting Club, which was organized by Dr. Hort when he was in Sunderland. The sports meeting was opened by Lord Haig, who paid a tribute to what the medical profession had done during the war and since in alleviating the sufferings of wounded and disabled men, and expressed the hope that such gatherings as that would encourage the men to make the fullest use of the artificial limbs. The sports were not arranged primarily as an exhibition, but in the belief that they would furnish data for carrying the present methods of using artificial limbs to an even further point of success. The handicapping committee included not only well-known Manchester sportsmen, but the professor of anatomy and the professor of physiology at Manchester University, orthopaedic surgeons, and others.

MEDICAL ARRANGEMENTS AT A GARDEN FACTORY.

The firm of Cadbury Brothers is well known as one of the pioneers of the industrial garden city, for their chocolate factory was moved from the heart of Birmingham to a country district outside so long ago as 1879, and the town of Bournville, carefully planned, has grown up around it. The health of the industrial worker received perhaps closer general attention in the later years of the war than ever before, and the measures adopted by this firm to maintain the health of their workpeople are of interest. Encouragement is given to athletics of every kind, and facilities for physical culture and recreation are provided. There is a medical staff of two full-time medical practitioners, one a lady, and four qualified nurses are attached to the surgery, three of them qualified masseuses. Before engagement every applicant's medical history is studied, a thorough medical examination is made, and the medical examiner may suggest the type of work most suitable. Special measures may also be recommended, such as a course in the remedial gymnasium with periodical re-examinations. All cases of sudden illness at work are seen by a medical officer, and if continued medical attention is necessary the patient may be attended either by his private doctor or by the works doctor, and also by the works nurse. In addition to advice, treatment, and medicine, the works doctor may authorize the free supply from the dispensary of extra nourishment. All accidents are immediately reported and prompt attention given, in trifling cases by members of the works ambulance, and in more serious cases by the works doctors. The works doctors are co-opted members of the Accidents Committee of the Works Council, which investigates all accidents, apportions blame, if any; takes steps to prevent a recurrence; and decides whether compensation shall be paid. Particulars of the symptoms of tuberculosis are circulated in the works, and employees who suspect its presence are encouraged to visit the works doctors, emphasis being laid on the necessity for early treatment. The firm maintains two convalescent homes, which are used not only for those recovering from illness but also to give a change of air and a rest to those threatened with breakdown. Three whole-time dentists are employed, together with two mechanics and four attendants, and as part of the preliminary medical examination all applicants for work are examined by one of the dentists, and a record is kept of the oral condition of those under the age of 16. It is a condition of employment that all who enter the works under 18 years of age shall have such dental treatment as is considered necessary by the works dentists.

Correspondence.

THE LEGIBILITY OF PRINTED MATTER.

SIR,—Your annotation on the above subject in the JOURNAL of September 23rd (p. 570) prompts me to draw your attention to a far more serious matter than the legibility of printed words, and that is that of printed figures. Whereas the association of ideas enables us to guess fairly accurately the probable sequence of words, with figures the case is vastly different. Errors in reading figures, whether of money or statistics, may lead to disaster. It is therefore very important in the interests of both old and young that there should be no possibility of mistaking one figure for another.

The ends of figures having open loops, such as 2, 3, and 5, should not be curled up; such turning makes these figures somewhat like an 8. In 4 the oblique stroke should be thicker, as, in indifferent light, it might be mistaken for a 1. So figures with tails—6, 7, and 9—should have these strokes prolonged above or below the line respectively; a 6 or 9 with its ends curled in is easily mistaken for an 8.

I see in the text of our JOURNAL many of the figures conform to my suggestions.

Would it not be possible for a committee to be called together composed of typefounders and printers with the view to authorizing a standardization of figures?—I am, etc.,

Chichester, Sept. 28th. HEYWOOD SMITH.

INHERITANCE AND MENTAL DEFECT.

SIR,—We must, I think, concede Sir Archdall Reid's contention that nothing but predispositions to produce characters in response to fitting nurture can be inherited. In that case, obviously, all characters, as distinguished from likenesses and differences between individuals, are equally innate, acquired, and inherited.

But if the Mendelians are right and there is alternate inheritance (not merely alternate reproduction), his axiom, that "variations are the sole cause of non-inheritance; apart from variations, like begets like when parent and offspring develop under like conditions of nurture," does not nearly cover the whole field of study.

According to Mendelian doctrine, which is supported by an immense amount of experimental work, inheritance, in any given particular, tends to be from one ancestor only. In that case there remains an enormous field for research—a field larger than that covered by his axiom.

In his letter (August 26th) he stated that blending is universal, but he gives little evidence in support of an opinion which is opposed to much considered belief.—I am, etc.,

Chesham Bois, Bucks, Sept. 28th. W. BASTIAN, Surgeon Commander R.N.

EXPERT WITNESSES: SURGICAL AND MEDICAL.

SIR,—In common with every qualified practitioner, I welcome the very restrained and common sense letters of Mr. C. H. Fagge and Sir John Lynn-Thomas. I hope the British Medical Association will take up a strong attitude on this question. The *fons et origo* is here ultimately between the actively increasing knowledge of medicine and surgery, and very, very ancient methods of law which should be obsolete, and do not spell justice. The present occasion is "fractures"; perhaps even more of an anachronism exists in the medical and legal aspect of mental disease.

It is time that legally qualified practitioners were absolved from a lot of useless anxiety. Law should mean justice, and the period between aviation and the Ark should be definitely determined.—I am, etc.,

Sevenoaks, Oct. 1st. GERALD SICHEL.

A CASE OF SUPPOSED SUPERFOETATION.

SIR,—The following case seems to be of some interest:

The patient was a primipara whose last menstruation had commenced on May 9th. I saw her on January 10th and found a transverse lie, which was easily dealt with by external version. Labour started at 11.30 p.m. on February 11th and a baby weighing 11¼ lb. was delivered with the help of forceps at 6 p.m. on the 12th. The placenta and membranes came away quite complete. No abnormality of cervix or uterus was observed. On February 13th and 14th she was quite well.

On February 15th the nurse informed me that pressure on the fundus caused something to bulge into the vagina. I found that she was quite correct, and with a pair of dressing forceps I removed from the vagina a complete bag of membranes containing a small foetus, which seemed to be quite fresh and showed no sign of any decomposition, mummification, or dehydration. I sent the specimen to Dr. J. D. Barris of St. Bartholomew's Hospital, who has kindly informed me that he considers the age of the foetus to be about 16 weeks. He is keeping it for the hospital museum.

Is this to be regarded as a case of twin pregnancy with one blighted ovum or as a genuine case of superfoetation? Against the former is the fact that the ovum seemed to be quite normal; against the latter that the patient does not appear to have menstruated during the nine months preceding the accouchement.—I am, etc.,

Alexandria, Egypt. E. N. RUSSELL, M.D., B.Ch.Cantab.

UNSUSPECTED PREGNANCY.

SIR,—Dr. Fletcher and Dr. Williams have each contributed one case of this condition, and one case is all that a practitioner is likely to see, however long his experience.

Rightly to appreciate the cases to which these gentlemen refer, I, and I think *we*, require a little more information, because certain circumstances are necessary to bring about such a result.

A full-time undiagnosed pregnancy presupposes (*a*) a regular cervical menstruation, and (*b*) a large woman or (*c*) a small child (this word to include all the contents of the uterus).

I also, in thirty years' slavery as an accoucheur, only met one case of "unsuspected" pregnancy. She was a very large woman, and quite as stupid as her husband, who applied turpentine stupes in an idle attempt to stop the pains. In this case there was no reason to question the *bona fides* of the mother, because she had been married sixteen years, it was her first child, she was living with her husband (this latter statement should be underlined), and she was obviously delighted with the result of her labour; but given a woman of average size, with uterine contents of average bulk, I have no hesitation in asserting that she cannot go to full time without suspecting her condition.

Perhaps your correspondents will be good enough to inform me as to the points I have raised, and thus add to the value of their communications.—I am, etc.,

London, W., Oct. 2nd. GRAHAM GRANT.

EMETINE INJECTIONS.

SIR,—It does not appear to be generally recognized that the precautions which are usually adopted to safeguard against local reaction where an injection of strychnine is given hypodermically are inadequate where emetine hydrochloride is administered by repeated injection. I have found that, even when doses of from 1/2 to 1½ grains are given on alternate days for a complete month (as is generally necessary to produce a permanent cure for schistosomiasis with this drug) the commonly experienced local pain from emetine injections can be avoided (1) by using only reliable preparations of emetine; (2) by giving the injection intramuscularly instead of subcutaneously; (3) by dissolving the tablet in a boiling solution of 1 per cent. carbolic acid immediately before injecting the dose; (4) by having a good supply of reliable needles. To avoid unnecessary trouble, it has been my practice to boil my hypodermic syringe and needle in this solution within its metal case, usually over a spirit lamp; the tablet quickly dissolves when 1 c.cm. of this hot solution is drawn up into the syringe, and some rectified spirit may be used, both to render the site of the injection slightly anaesthetic and antiseptic and to cleanse the syringe and needle before they are returned dry to the case. The addition of this weak solution of carbolic acid does not alter the character of the drug and is certainly very gratifying to the patient, whose condition may be too much impaired by the presence of the numerous parasites of amoebic dysentery or bilharzia disease to stand the risks of local sepsis.—I am, etc.,

Durban, Aug. 31st. F. G. CAWSTON, M.D.Cantab.

THE RADICAL PREVENTION OF VENEREAL DISEASE.

SIR,—It is the looker-on who sees most of the game. In the present controversy both sides are right—and wrong. The umpire's decision, as usual, will please neither side.

Obviously, prevention by disinfection is sound in principle. If every potential sinner is taught in advance to disinfect properly and promptly enough, and does so, venereal disease will cease. That is quite clear. Obviously, too, prevention by moral suasion is sound. If every potential sinner is taught in advance such a dread of venereal disease that he (or she) abstains from illicit union, syphilis and gonorrhoea will vanish. That is equally unquestionable.

Both methods are sound—in theory. Both methods are failures—in practice. Neither method is radical enough. Each fails for the same reason—because human nature is what it is.

Disinfection falls short in practice because men are not saints. It demands a certain degree of unselfishness from the average sinner—or at least some selfish prudence. And the average sinner falls short of the requirements. He forgets, or he "imbibes," or he "won't be bothered." Even in the army such failures are numerous. Will the failures be less in civil life?

Moral propaganda based on fear of consequences fails in practice because men are human. The motive appealed to is mostly a selfish one; and you will not make a man unselfish from a selfish motive! To abstain from doing what you think it is right to do, from selfish fear, is cowardly. It is not working upon a man's higher instincts. Such an appeal is pitched too low to be effective.

Once again, disinfection fails because it is not radical enough: it is too superficial in its action; it must penetrate deeper than the epithelial surface. It must reach the cells of the cerebral cortex; the centres controlling genital impulses stand in need of purification as much as the more external genital organs.

In the same way, moral suasion by means of fear fails because it is not sufficiently thorough. To ensure success it must be applied in the thoroughgoing fashion of the Zulus. In the days before Britain tampered with them the Zulus were a more moral people than we. The penalty of illicit intercourse was death, and it was enforced. Illicit unions were not numerous in Zululand. Unless applied in this thoroughgoing style the moral propaganda based on fear of consequences will fail. It did with the Jews. Moses commanded that the adulterer and adulteress be both stoned. But we find, some centuries later, that though a certain Jewish adulteress was brought up for condemnation her male fellow sinner seems to have gone free, and none of her male accusers could claim the right to throw stones at her. The Jews were more one-sided than the Zulus in the enforcement of their law. Such lax, one-sided application of the moral method is foredoomed to failure.

With both the sexual sinner and the moralist the real trouble is an arrest of development. The sexual sinner suffers from arrested development of the sex instinct. In his case an animal lust for the female has not developed into a human, humane love for woman. His sex instinct is still subhumane; it has not evolved beyond the selfish, antisocial stage to its normal "sublimation" in humane, social instincts. The moralist, whose propaganda depends on fear—whether of punishment or of other consequences—suffers from arrested development of his morality. He is still—morally—in the "Mosaic dispensation." His propaganda is pre-Christian in principle. He makes the selfish sinner more selfish still by cultivating selfish fears. His moral methods are, to that extent, Mosaic.

Thus we arrive at this paradox: the method of external disinfection fails in practice because it asks too much of human nature; it requires men never to be careless, or lazy, or drunk. The "Mosaic" moralist's method fails in practice because he asks too little of human nature; he asks a man to cease from *one* selfish habit for fear of consequences, instead of asking him to cease from *all* selfish habits for love of his neighbour.

The onlooker finds the results, on both sides, poor and disappointing. So much energy, so much argument, so much controversy, and so very little progress! An almost pathetic letter on this subject appeared in the BRITISH MEDICAL JOURNAL some months ago, expressing a sense of the ineffectiveness of all methods hitherto adopted. Its writer lamented the slowness of results from the moral propaganda of Moses and St. Paul; more rapid remedies were called for in his view; personally he recommended "rubber sheaths of good material" as the best preventive. His medical qualifications were above the average: his sense of humour hardly equalled them.

Let us do justice to St. Paul: he lamented the failure of Moses more deeply than any of us. He claimed that his own psychological principles produced far more hopeful results. His mode of preventing illicit unions was totally different. The "circumcision" he advocated was a far more radical operation than that of his Jewish predecessors. It is the most radical, as well as the most rational, way of preventing venereal disease. Moses commanded the removal of the foreskin. St. Paul superseded this by a "circumcision of the heart"—the excision of all selfish impulses. Cure selfishness and you prevent syphilis. For after all, sexual sins are but one of the many symptoms arising from that chronic infection—selfish-mindedness. Private passions must be dominated by a passionate public-mindedness. Sexual sin must be remedied by the normal sublimation of the sexual instinct. St. Paul's argument runs somewhat on the following lines:

Abnormal actions proceed from abnormal thoughts. Disinfect the thoughts and the actions will look after themselves. Sexual sin, like money-grubbing, is merely a manifestation of a selfish mind. (It is interesting to note in this connexion that St. Paul classes the fornicator and the money-grubber together; both are outsiders, self-excluded from "the Kingdom" by their selfish-mindedness.) Further, habit can be overcome by counter-habit. Selfishness *can* be conquered—inhibited—by a constant habit of unselfish thinking. Moses had treated separate symptoms superficially. St. Paul dealt radically with the disease itself. He proved that it is more effectual to attack *all* sins than one sin. Obviously, if you can teach men a habit of thinking unselfishly in regard to everything, selfishness will vanish in all its various forms, whether sexual or otherwise. He who loves his neighbour will not make a prostitute of her. A universally applied habit of unselfish thinking—practised every day in every way—will get stronger and stronger, and inevitably dominate all the "weedy" habits, or wild oats, of weaker growth. Man of all creatures has an unequalled faculty for acquiring new aptitudes. Hereditary vices, or weaknesses of disposition, will stand no chance against an acquired aptitude of unselfish thinking—a public-mindedness—which operates every minute of every day, increasing in power by constant exercise. The tendency to think unselfishly is no foreign importation: it is native to the soil of the human mind. It is present in every individual, as is evident if a stimulus be applied of sufficient strength. It *has* been cultivated so as to control and subdue all the vicious weeds of the mind—wild oats included. It has been done successfully in thousands of cases, in every century of the Christian era, by ordinary people. They were most of them pupils of St. Paul, or his colleagues, or of later teachers who had grasped something of his method and principles. For, in his post-graduate days, St. Paul had discovered an "emotional stimulus to morality" that proved surprisingly successful. It is the most radical preventive of venereal disease yet discovered. But the details of its application lie outside the province of a medical journal. As psychologists, however, we know that any moral propaganda without an adequate emotional stimulus is fundamentally feeble and ineffectual.

Are these principles obsolete? Are they too slow of result to be considered by practical modern scientists? Must they give place to calomel cream, or "rubber sheaths of good material"? Possibly a compromise, or combination of methods, may prove the wisest course. In order to estimate their comparative value let us apply the historical test:

1. External disinfection: tried for several years, with special zeal in some parts of Germany. Result, disappointing. By-product—lowered moral standard.
2. Rubber sheaths: tried for some ninety years, especially in France. Result, disappointing. By-product—slow national suicide.
3. Mosaic moral suasion: tried for some nine hundred years or more, especially in Palestine. Result, inadequate. By-product—pharisaism.
4. Pauline psychological method—"circumcision of the heart": tried for nearly nineteen centuries in most European countries. Result, disappointing and inadequate to modern idealists; still, under all the circumstances, rather a surprising success. By-product—the difference in morals between the first and twentieth centuries A.D.

We must leave it to the historians to measure that difference. In our pessimistic moments we are apt to underestimate it. Of these four competing methods, which would a wise reformer seek to reinforce? Which method will prove, in the long run, the most effectual? Which will promote "the greatest good of the greatest number"?

Two reflections present themselves to the moral idealist here. More haste may mean less speed. The method that appears most rapid may prove a deceptive short cut, bringing us to a destination neither anticipated nor desired. If, by a propaganda of external disinfection, we enable men to escape syphilis, at the cost of depraving their sexual instinct and weakening their self-control, have we done more harm than good to the individual? Is society in the end benefited by the net result? Perhaps after all St. Paul's slower radical method may prove the most rapid as well as the most rational.

Meantime we must compromise to some extent. External disinfection has its due place. So long as there are unfortunate individuals among us in whose upbringing St. Paul's radical operation was omitted or inadequately done: so long as there are those whose sexual instinct has had its development arrested at a subhumane level: so long as there are social failures who make prostitutes of other men's sisters—external disinfection should be practised by all such. It is their duty to society, and we must hope that they will have retained enough of a conscience to do it. It is the least these weaker brethren can do if they have any decency left. Even though they should succeed in washing the last spirochaete or gonococcus off their external genitals, the internal centres are not greatly benefited; the mind remains as selfish, as sensual, as semi-civilized as ever: their thoughts are filthy still.

Let the moralist, however, beware in his turn lest he sin from too much zeal and fall into a censorious pharisaism. Who are we to cast stones? Are any of us without sin when judged by the post-Mosaic standard? That standard is a severe one, and its searching relentlessness may well disarm criticism of our weaker brethren. For the post-Mosaic standard of sexual morality has been put in these words: "Whosoever looketh on a woman to lust after her hath committed adultery with her already in his heart." Judged by that standard, how many of us are entitled to cast a stone at any other sinner? Even a "moral idealist" must hold his hand and make his apology to his fellows if his criticism of himself and them has at all savoured of pharisaism. With that apology, therefore, these reflections on a vital question are submitted for consideration.—I am, etc.,

Sheffield, Sept. 22nd. HERBERT CAIGER.

THE THYROID GLAND AND DISEASED TONSILS.

SIR,—Dr. H. Crichton Miller's most interesting paper on the psychic and endocrine factors in functional disorders, published in the JOURNAL of September 23rd, 1922, contains a paragraph on page 552 which I venture to think needs elucidation.

Speaking of "the chronic colds and sore throats . . . which culminate in a belated enucleation of tonsils," he asks, "How

often does a laryngologist in such circumstances stop to think of the once efficient thyroid now morphologically altered beyond repair?"

Are we to assume that the enucleation is followed by injury to the thyroid as a direct result of the operative interference?—I am, etc.,

September 29th. M.A., M.D.

Obituary.

W. S. HALSTED, M.D.HAR., F.R.C.S.ENG. and EDIN.,
Professor of Surgery, Johns Hopkins University, Baltimore.

THE death is announced of Dr. William Stewart Halsted, professor of surgery at Johns Hopkins University, Baltimore, since 1889. He was born in 1852, and graduated in New York in 1877. He was an honorary Fellow of the Royal Colleges of Surgeons of England and of Edinburgh; he received the honorary degree of LL.D. from Yale in 1904 and from Edinburgh in 1905, and the honorary degree of D.Sc. from Columbia University in 1904. He was one of the pioneers of modern surgery in America, and his name will always be remembered in connexion with the Johns Hopkins Hospital, the foundations of whose reputation were laid by Osler, Welch, Kelly, and Halsted. In 1907 a portrait group of those four friends, painted by Mr. J. S. Sargent, R.A., was presented to the hospital.

Besides many other contributions to surgery there are four subjects upon which Dr. Halsted made important observations. The modern operation for cancer of the breast was instituted by Mitchell Banks of Liverpool. His first paper was published in 1877, a second in 1882, and a third in 1887; amongst other things he advocated a circular incision, undercutting the skin, the removal of the pectoral fascia and lower part of the pectoralis, as well as the axillary glands, whether enlarged or not. In this he was opposed by some of the most prominent London surgeons. In his Lettsomian lectures to the Medical Society (BRITISH MEDICAL JOURNAL, 1900, i, 557) he stated that of 213 cases treated by the method he advised some 67 were alive three to twenty years later, and that among the last sixty operations there had been no deaths. Heidenhain (*Langenbeck's Archiv*, 1889) and Stiles (*Edinburgh Medical Journal*, 1892) gave a more exact description of the lymphatic system connected with the breast, which has served as a guide in connexion with the question of what should of necessity be removed. Halsted commenced his contributions to the subject in 1889 by proposing that the pectoralis major should be completely removed in every case, and that the supraclavicular glands should be excised after division of the clavicle. Later on, however, Halsted himself gave up the division of the clavicle, and excision of supraclavicular is an exceptional and generally unsuccessful addition to the operation; surgeons now remove the pectoralis major except the clavicular portion. In Deaver's work (Deaver, McFarland, and Herman, *The Breast: Its Anomalies, its Diseases and their Treatment*, 1918) is included a table of cases operated on by Halsted. There were 204 operations; 13 patients were lost sight of; of the 191 reported on 39 (20 per cent.) were alive and well five years after the excision, 10 had died within the five years without recurrence, and 10 had died of metastases over five years after the excision.

Halsted was a pioneer in the use of rubber gloves when operating. Cotton gloves had previously been recommended, by Mikulicz-Radecki of Breslau in particular, and in spite of drawbacks had been widely adopted by surgeons when, in 1890, Halsted advised rubber gloves, the making of which he superintended so that a workmanlike article was produced and was generally adopted. The introduction of antiseptic surgery by Lister rendered the radical treatment of hernia practicable. Attention was particularly concentrated upon the removal of the sac. A method of doing this was described by Sir W. Macewen of Glasgow (*Annals of Surgery*, 1886, iv, 87). In 1887 the late Mr. Arthur Barker (BRITISH MEDICAL JOURNAL, 1887, ii, December 3rd) described the method now commonly used of ligaturing the neck, and after cutting away the sac fixing the stump within the internal ring. In 1884 Bassini, believing that recurrence of hernia after operation was due to yielding of the transversalis fascia, had suggested that this might be obviated by suturing the internal oblique and transversalis muscles behind the spermatic cord; he described 100 cases in 1888 (Ital. Chir. Cong., Napoli, 1888). Halsted in 1890 (BRITISH MEDICAL JOURNAL, 1890, i, 495) went farther and sutured the aponeurosis of the external oblique as well under the cord, after excising the pampiniform plexus. The cord was thus rendered subcutaneous and liable to become tender. Atrophy of the testis also was apt to follow, and O'Conor in 1898 said this happened in 20 per cent. There proved to be a special tendency also to hydrocele after Bassini's operation, as well as after Halsted's modification, and surgeons generally reserve the procedure for direct hernia.

In 1920 Halsted published in the *Johns Hopkins Hospital Reports*, vol. xxi, a treatise on "Ligations of the first part of the left subclavian artery"; the main point of the paper was that the operation demands the highest anatomical knowledge and surgical skill on the part of the surgeon, owing to the multiplicity of important structures behind the origin of the left sterno-mastoid muscle. Halsted's first operation was performed in 1892, and was accompanied by excision of the subclavian aneurysm; the operation had been performed unsuccessfully four times before; Halsted's patient was cured. His second operation (also successful) was performed in 1918. The first case to be successful in this country was operated upon by Charles Stonham in 1899, and the man was shown to the Clinical Section of the Royal Society of Medicine in 1921, twenty-two years after the operation.

We are indebted to Sir BERKELEY MOYNIHAN, Bt., for the following tribute to Dr. Halsted:

The death of Dr. W. S. Halsted removes one of the greatest of American surgeons. Trained as an anatomist, he took to surgery, its science and its art, with great and eager enthusiasm at the time of the inauguration of Johns Hopkins Hospital. Osler, Welch, Howard Kelly, and Halsted were the heads of the departments when the work of that hospital began; the services of each of them have been of the highest order, and it is probably true to say that their association together in those early days has been the means of developing there the authentic spirit of scientific medicine, as truly and as speedily as in any other hospital in the world. Halsted appeared to be the most reticent of the four. His struggles, in his younger days, against ill health won the respectful admiration of all his friends, of those more especially who knew how grim and arduous the conflict was. Soon after his appointment to Baltimore he began to surround himself with pupils, whom he trained by the example of his own surrender and devotion to the infinite toil of surgical work, both on the side of research and on that of its clinical practice.

It may justly be claimed for him that he introduced many of the technical methods now embodied in the everyday work of surgeons throughout the world; that he established principles for the proper conduct of operations hitherto performed in a haphazard or perfunctory manner; and that he trained and influenced men who are now teaching the whole world, and carrying out in many schools the ideals with which he first inspired them. Crile, a superb master of the craft of surgery, and a great disturber of intellectual traffic, has said that he owes more to Halsted than to any man. Harvey Cushing, unsurpassed in exquisite perfection of technical work and unequalled in breadth and depth of surgical knowledge of the nervous system, and Finney, one of the wisest of men, of wide experience and profound sagacity, both own Halsted as their master. Bloodgood, at least as learned in pathology as any surgeon of the day, was taught and guided by Halsted, and Young, among the most skilful and deft of urologists, learnt his first principles under the same inspiring teacher. If a man's greatest gift to surgery is the number of the pupils trained by him in the highest ideals of research and of practice, then for Halsted there may justly be claimed a place among the most eminent surgeons of the time.

His name will long be associated with the surgery of hernia, of cancer of the breast, of the thyroid and parathyroid glands, and of the vascular system. On all of these subjects he wrote with an authority derived in part from the most patient research, both experimental and clinical, and in part from an operative experience that, in his own hands and in those of his assistants, became stupendous. As an operator he was exceedingly patient and careful. It was he who first used rubber gloves and who then set the fashion for all the world. His method of dissection, of frequent light, swift, sparing movements with the sharpest of knives, instead of the free, heavy-handed deep cutting, of no haemorrhage or the minimum of haemorrhage instead of the severance of many vessels, each bleeding freely until clipped, has become a part of the ritual of the great surgical artists of the day. His method required time, but it was results and not the

time taken to win them that he counted. It was said in jest that if you wanted to watch Halsted perform a radical operation for cancer of the breast, you must hurry away from breakfast to see him and take your lunch with you. But he lost few cases, and the proportion of "cures" from his very extensive and minutely accurate operation was taken as the standard of the best that surgery could do.

He has joined the immortals. For it is certain that so long as the craft of surgery is practised some of the principles which he was the first to formulate, and some of the technical methods which he was the first to devise and to make perfect, will be a part of the creed and of the daily ritual of every man.

THE LATE SIR JAMES AFFLECK.

DR. WM. MURRAY CAIRNS, C.B.E. (Liverpool), sends the following tribute as a supplement to the obituary notice published in our columns last week (p. 617):

To his old students, scattered over the whole world, the news of the death of Sir James Affleck will bring a deep sense of loss, for to an innumerable host of our profession he was a veritable father in medicine; nay more, to multitudes of his fellow men—colleagues, students, patients, friends—he was in very truth the beloved physician. Efficiency, sympathy, modesty were outstanding characteristics. His professional ability was evident in all the departments—and they were many—of his work. But it was as a teacher, and especially as a clinical teacher, that he shone. He had a quiet but eminently effective way of combining his personality with his teaching, and of so impressing these upon his students that they could never forget the one or the other. For example, thirty years ago, in his incomparable clinics, he used to say to us students, "When you become practitioners, examine the heart of every patient who consults you, whatever the patient is complaining of: do this always: never omit it." And last week, when I was north, I paid a visit to Edinburgh, partly to see again my old teacher. During our chat I took opportunity to say to him that, literally, in my consulting-room, now "thirty years on," I think of him every day, and, remembering these words of his, I do as he enjoined upon us. Many of us now teachers ourselves gratefully remember how he would take us to a bedside and would point out the significance of a posture, of a movement, of an expression of the face, of the patient. And not only in these, but in other ways innumerable, I shall ever hold myself a debtor to this shy, quiet, unassuming man who, with all his shyness and reserve, was a mou'der of men, and who, by his quiet, forceful personality, made an indelible imprint on the life and work of a great company of those who, like myself, are proud to say "I was once his student."

The funeral took place at the Dean Cemetery, Edinburgh, on September 28th. In addition to near relatives, the pall-bearers included Sir Harold Stiles, representing the University of Edinburgh, Dr. James Stewart Fowler, representing the Royal College of Physicians of Edinburgh, Sir Joseph Fayrer, representing the Edinburgh Royal Infirmary, and Sir Henry Cook, chairman of the board of directors of the Longmore Hospital for Incurables. Among those who attended the funeral were Sir David Wallace, president, Dr. George Mackay, vice-president, and Mr. Alexander Miles, secretary and treasurer, representing the Royal College of Surgeons of Edinburgh; Dr. Byrom Bramwell, representing the Royal Hospital for Sick Children; Dr. Harry Rainy, vice-president, also representing Sir Robert Philip, president, of the Royal College of Physicians of Edinburgh; Dr. Dawson Turner, Dr. Alexander James, Dr. W. T. Ritchie, Dr. Arthur Sinclair, Dr. Allan Gray, Dr. William Stewart, Dr. James Ritchie.

WE regret to announce the sudden death of Dr. JOHN SCOTT TEW at his residence, Brook House, Tonbridge, Kent, on September 27th. He received his medical education at University College, London, and the University of Durham, and obtained the diplomas of L.S.A. in 1830 and M.R.C.S.Eng. in 1831. After taking the D.P.H.Camb. in 1887 he graduated M.B., B.S.Durham in 1839, proceeding to the M.D. degree in 1891. Dr. Tew was also a barrister-at-law of the Inner Temple. He had held the posts of assistant demonstrator of anatomy in the University of Durham College of Medicine, and medical officer of health for the Basford Urban District. In 1895 he went to live at Tonbridge on his appointment as medical officer of health for the West Kent Combined Districts, and medical officer to the Tunbridge Wells, Tonbridge, and Southboro' Joint Hospital Board. Since 1909 he had held a commission as sanitary officer with the rank of major in the R.A.M.C., Territorial Force. Dr. Tew was a member of the Tunbridge Wells Division of the British Medical Association; a Fellow of the Society of Medical Officers of Health, and a former president of the home counties branch; and he had been president of the Nottingham Medico-Chirurgical Society. His kindly tact and genial good nature won him the regard of the many medical practitioners with whom his work brought him in touch, and his death will be mourned by a wide circle of friends and colleagues.

Universities and Colleges.

UNIVERSITY OF OXFORD.

Radcliffe Prize, 1923.—This prize, of the value of £50, will be awarded by the Master and Fellows of University College upon the report of the Examiners (provided a sufficiently deserving memoir be submitted for adjudication) for a memoir, or papers, embodying research in any branch of medical science comprised under the following heads: Human Anatomy, Physiology, Pharmacology, Pathology, Medicine, Surgery, Obstetrics, Gynaecology, Forensic Medicine, Hygiene. The prize is open to all graduates of the University who have proceeded, or are proceeding, to a medical degree in the University. Candidates, at the date of application, shall not be Radcliffe Fellows; but the provision that candidates shall not have exceeded twelve years from the date of passing the last examination for the degree of B.A. is upon this occasion so far suspended as to enable any graduate who was eligible during the years of the war (1915, 1917, 1919), to be eligible for the next ensuing award (1923). Candidates are required to send in their memoirs to the Assistant Registrar on or before Friday, December 1st, 1922. No memoir for which any University Prize has been already awarded can be admitted to competition, nor may the prize be awarded more than once to the same candidate. Tuesday, March 20th, 1923, is the intended date of the award.

UNIVERSITY OF CAMBRIDGE.

THE Vice Chancellor has appointed Sir Hugh K. Anderson, M.D., F.R.S., Master of Gonville and Caius, together with Dr. T. C. Fitzpatrick, President of Queens', and Dr. Peter Giles, Master of Emmanuel, to be deputy Vice-Chancellors.

The following staff appointments have been made in the Natural Science Schools:—*Anatomy:* Dr. A. B. Appleton, senior demonstrator; Mr. D. G. Reid and Mr. A. Hopkinson, M.B., junior demonstrators; Mr. V. C. Pennell, M.B., additional demonstrator. *Physiology:* Dr. F. Roberts, junior demonstrator; Mr. T. R. Parsons, additional demonstrator. *Comparative Anatomy:* Mr. F. A. Potts, demonstrator. *Botany:* Mr. J. Walton, junior demonstrator.

UNIVERSITY OF LONDON.

LONDON HOSPITAL MEDICAL COLLEGE.

THE Price entrance scholarship in anatomy and physiology offered by the London Hospital Medical College, and open to students of the Universities of Oxford and Cambridge, has been awarded to Mr. J. Gray, of Fitzwilliam Hall, University of Cambridge.

UNIVERSITY OF DURHAM.

AT a convocation held on September 23rd the following medical degrees were conferred:

M.D.—J. M. Gover.
M.B. B.S.—H. Moray, S. Bell, G. A. Mason.

The Services.

HONOURS.

THE following appointments to the Order of the British Empire, published in the *London Gazette* of June 7th, 1918, have, on the recommendation of the Secretary of State for War, been transferred to the Military Division of the Order: Officers: Lieut.-Colonel James Muir Crawford, I.M.S., Major (temporary Lieut.-Colonel) Henry Ross, I.M.S.

FOREIGN DECORATIONS.

The following are among the decorations awarded by the Allied Powers indicated for distinguished services rendered during the war 1914-19:

President of United States of America.—Distinguished Service Medal: Major-General Sir William G. Macpherson, K.C.M.G., C.B., late A.M.S.

King of the Belgians.—Ordre de Leopold (Officier): Colonel Arthur M. Connell, T.D. (Territorial Force, retired).

President of the French Republic.—Médaille d'Honneur avec glaives, en Vermeil: Temporary Lieutenant Henry G. Arnott, R.A.M.C.

King of Italy.—Order of the Crown of Italy (Officer): Lieut.-Colonel (temporary Colonel) James C. Robertson, C.M.G., C.I.E., C.B.E., I.M.S., Lieut.-Colonel Alfred E. Weld, R.A.M.C. (Reserve of Officers).

King of Rumania.—Order of the Crown of Rumania (Commander): Brevet Lieut.-Colonel Eugene Ryan, C.M.G., D.S.O., R.A.M.C.; (Chevalier): 1st Class Subassistant Surgeon Dilbag Rai, I.M.D.

King of the Serbs, Croats, and Slovenes.—Order of St. Sava (3rd Class): Brevet Lieut.-Colonel John A. Anderson, R.A.M.C.

DEATHS IN THE SERVICES.

COLONEL WILLIAM YOUNG, Bengal Medical Service, died at Northbank, Perth, on September 20th, aged 51. He was the younger son of the late Captain James Murray Young, of Hillhead, Glasgow, and was educated at Glasgow University, where he graduated M.B. and C.M. in 1892; he became F.R.C.S.Edin. in 1907. He entered the I.M.S. as surgeon lieutenant on January 30th, 1893, became lieutenant-colonel after twenty years' service, and attained the rank of colonel on March 23th, 1921. Most of his service was spent in civil employ in the United Provinces of Agra and Oudh (formerly the North-West Provinces), where he held for many years the important post of civil surgeon of Cawnpore. On promotion to the administrative grade last year he was appointed inspector-general of civil hospitals in the Central Provinces.

Medical News.

THE first meeting of the 150th session of the Medical Society of London will take place on Monday, October 16th, at 8.30 p.m., when the incoming president, Lord Dawson of Penn, G.C.V.O., will deliver his presidential address on "Certain developments in medicine," which will be followed by a discussion.

THE Museum demonstrations at the Royal College of Surgeons of England will be resumed on Friday next, October 13th, when Sir Arthur Keith, F.R.S., will exhibit specimens illustrating the effects of castration in man, at 5 p.m. On the following Monday, October 16th, at the same hour, Professor Shattock, F.R.S., will demonstrate specimens illustrating the anatomical results of inflammation. Other demonstrations will be given on each Friday and Monday during October.

ALDERMAN J. T. T. RAMSAY has been elected mayor-designate of Blackburn. Dr. Ramsay is the first medical man to attain to mayoral rank in Blackburn, an honour which he has gained by a long and distinguished career devoted to the public service. He is a Scotsman, and received his medical education at the Edinburgh medical school, where he took the diplomas of L.R.C.P. and L.R.C.S.Edin. in 1891. He has been in general practice at Blackburn for the past thirty years.

THE annual dinner of the Society of Medical Officers of Health will be held at the Hotel Cecil, Strand, W.C., on Friday, October 20th, at 7.30 p.m. Amongst those who have accepted invitations are the Minister of Health (Sir Alfred Mond), Sir Arthur Robinson, Sir George Newman, Sir Humphry Rolleston, P.R.C.P., and Sir Anthony Bowlby, P.R.C.S. Ladies are invited, and members, or candidates nominated for election, are asked to give early notice to the Executive Secretary, 1, Upper Montague Street, Russell Square, W.C.1, of their intention to be present, with the names of their guests. A payment of 12s. 6d. for each ticket should be made with applications sent before October 14th; after that date the cost of tickets will be 15s. each.

A MEETING of the Metropolitan and Home Counties Subgroup of the Maternity and Child Welfare Group of the Society of Medical Officers of Health will be held at 1, Upper Montague Street, Russell Square, W.C.1, on Tuesday, October 10th, at 5.15 p.m., when a paper will be read by Mr. G. E. Waugh (senior surgeon to Great Ormond Street Children's Hospital) on "The prevention and treatment of nasal and aural infections in infancy." Tea at 5 p.m. Members are invited to bring friends.

THE eleventh annual general meeting and conference of the British Commercial Gas Association will be held in the Museum and Art Gallery, Bristol, on October 16th, 17th, and 18th, under the presidency of Sir George E. Davies. Members of the conference will be welcomed at a reception on the evening of October 16th, when Sir Henry Gauvain, M.D., will deliver a lecture upon "Light and life."

THE new post-graduate course at the National Hospital for the Paralysed and Epileptic, Queen Square, W.C.1, will commence on October 9th and continue until December 6th. The course will consist of lectures on the pathology of the nervous system, out-patient clinics, lectures and demonstrations on neurological ophthalmology, and clinical lectures and demonstrations.

UNIVERSITY COLLEGE, London, announces a large number of lectures; among others, a public lecture on "The beginnings of science," which Professor G. Elliot Smith, F.R.S., will give next Monday at 5 p.m.

The Life of Lord Moulton, by his son, the Hon. H. Fletcher Moulton, which will be published shortly by Messrs. Nisbet, should prove of special interest to medical readers. Medicine owes much to him as an exponent of its development, and for his memorable defence of the rights of research, while as chairman of the Medical Research Committee he did invaluable work.

DR. ROBERT KNOX will give a lecture on *x* rays and radium in the lecture theatre of the Medical School, King's College Hospital, Denmark Hill, to-day (Saturday), October 7th, at 4 p.m.

THE annual dinner of the London School of Tropical Medicine will be held at the Trocadero Restaurant on Wednesday, November 1st, at 7.30 p.m., with Dr. Hugh S. Stannus in the chair.

THE annual dinner of the Reunion Association in connexion with the Prince of Wales's General Hospital and North-East London Post-Graduate College will be held at Pagani's Restaurant, Great Portland Street, W., on Thursday, November 9th, at 8 o'clock, with Dr. F. G. Crookshank in the chair. The price of tickets will be 12s. 6d. each (exclusive of wines). Prospective members of this association are asked to communicate with the Honorary Treasurer, Mr. S. O. Rashbrook, 1, Priory Terrace, Kew, Surrey.

THE opening post-graduate lecture of the winter session will be given by Sir James Galloway, K.B.E., C.B., in the West Lecture Hall, Royal Society of Medicine (by kind permission), 1, Wimpole Street, W.1, on Wednesday, October 11th, at 5 p.m. The subject of the lecture will be "Hodgkin's disease and similar unexplained maladies" (with lantern illustrations), and the chair will be taken by Sir George Makins, G.C.M.G., C.B. The lecture is open to members of the profession.

THE Royal Sanitary Institute will hold a sessional meeting at the City Hall, Cardiff, on October 13th and 14th, when Dr. J. S. Peebles, M.O.H. Bridgend Urban District Council, will open a discussion on health education of children. A discussion on open-air schools will be opened by Mr. E. E. Morgan, borough architect, Swansea. The chair will be taken by Dr. Louis Parkes, chairman of the council of the Institute, at 4.30 p.m.

"HEALTH WEEK," which was instituted by the Royal Sanitary Institute in 1912, will be held this year from October 8th to 14th. Its object is to focus public attention on questions concerning public health, to arouse a sense of personal responsibility in it, and to create general interest in this work. The promoters of the movement hope that medical officers of health will make some special effort during the week to arouse public opinion in favour of a high health standard in each locality, and it is also suggested that school teachers might give simple health talks to school children.

THE autumn session of the West London Hospital Post-graduate College will open on Monday, October 9th, and will extend to Saturday, December 16th. There will be a lecture or demonstration at 4.30 p.m. every day except Saturdays; demonstrations will be given daily in the medical and surgical out-patient rooms and the special departments at 2 p.m.; and several courses of special lectures and demonstrations have been arranged. Full particulars may be had from the dean of the college, Dr. Arthur Saunders, at the West London Hospital, Hammersmith, W.6.

THE Herefordshire Medical Society has just acquired new quarters at 20, East Street, Hereford, which are open to any member of the profession who may be visiting the neighbourhood, as well as to subscribing members residing in the county. It is a very old society, and its members would be very grateful if any authors or others would contribute any modern books to augment the library. Communications may be addressed to Dr. J. Oswald Lane, Honorary Librarian.

THE late Mr. Daniel Clark of Cheltenham, who died on June 30th leaving net personalty of £43,786, has bequeathed £5,000 each to the Leeds General Infirmary and the Cheltenham General Hospital and £2,000 to the Bath Hospital, Harrogate. After paying other bequests the residue of the property, which will probably exceed £30,000, is to be divided between the following hospitals: St. Bartholomew's, Guy's, London, St. Thomas's, St. George's, King's College, University College, Charing Cross, St. Mary's, and Middlesex.

A GOLD medal and other gifts were presented to Professor Barduzzi at Siena recently, on his resignation from the chair of skin diseases and syphilis; the occasion was also the fiftieth anniversary of his professorial career. A history of his career was published and presented to him by the medical students.

MESSRS. BAILLIÈRE, TINDALL, AND COX announce for immediate publication a biography of Lawson Tait by Dr. W. J. Stewart McKay; a *Textbook of Industrial Hygiene*, by Dr. E. W. Hope, M.O.H. Liverpool; a fourth edition of Dr. Tredgold's *Mental Deficiency;* and the eleventh edition of Sir William Whitla's *Pharmacy, Materia Medica, and Therapeutics*. They also announce books by Drs. Pearson and Mouchet on the *Hygiene of Native Compounds in Tropical Africa* and by Harold Burrows, F.R.C.S., on *Mistakes and Accidents of Surgery*.

DR. ROBERT TIDBURY, on the occasion of his retiring from the office of assistant medical officer of the Borough Mental Hospital, Ipswich, has been presented with an inscribed silver cup by the staff and a smoker's cabinet by the patients.

THE endowment received by Harvard University last year from the Rockefeller Foundation to establish a new School of Public Health has enabled the existing facilities for training and research in industrial medicine to be broadened and extended. The chief need of students is for brief courses, or groups of courses, of study and research leading to higher degrees. Students who enter for courses leading to a degree or for brief periods of special work must register in the School of Public Health, after satisfying the Committee of Admission of their fitness to pursue an approved course looking towards a definite objective. While the desirability of admitting students to short and highly specialized courses of study and practice is recognized, such opportunities are reserved for those whose academic or field training is recent and promises success in the programme outlined. To such special students no degree is given—merely a statement of the work done and the grades attained. The degrees offered in the School of Public Health are: Bachelor of Public Health; Master of Public Health; Doctor of Philosophy (in Hygiene); Doctor of Medical Sciences; Doctor of Public Health. Two years' study are ordinarily required of a medical practitioner aiming at the Doctorate in Public Health; during the first year he pursues courses bearing upon industrial hygiene; the second year is devoted to work in his special field, and to the composition of a thesis. Several fellowships of 1,200 dollars a year are open to those qualified to undertake work in any of the medical sciences bearing upon public health, in vital statistics, or in practical hygiene. Further information may be obtained from the secretary of the Harvard School of Public Health, Boston, Massachusetts, U.S.A.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

QUERIES AND ANSWERS.

CORNS AND WARTS.

"C."—So-called corns on the soles of the feet often prove to be concealed warts and require surgical measures. The advice of a dermatologist could be sought, or, if the "corns" are associated with Morton's disease, it may be well to consult an authority on orthopaedic surgery.

MAJOR F. R. BORDEN, Medical Corps, U.S.A., writes from Camp Stanley, Texas, in reply to an inquiry published in our issue of August 5th (p. 240), that a simple and efficient remedy for warts of the scalp will be found in the daily application, for four or five days, of solution of formaldehyde, U.S.P., which appears to be identical with the solution of the *British Pharmacopœia*.

INOCULATION FOR THE TROPICS.

"S. C." asks what inoculation, in addition to revaccination, should be given to a patient who is going out to a remote rubber plantation in the Straits Settlements.

*** The patient ought to be inoculated with the triple typhoid vaccine—typhoid, paratyphoid A, and paratyphoid B. Two inoculations are required, and the material can be obtained from Burroughs, Wellcome and Co. Full directions are issued with the vaccine.

INCOME TAX.

"W." does part-time work for a county authority and is allowed a sum for travelling expenses by the authority.

*** If he makes a general income tax return in one sum, including his county receipts, and deducting all his professional expenses, the amount allowed him should be included as a professional receipt; if, however, he returns the salary separately and deducts nothing, either in that return or in the return of his profits, on account of the travelling expenses which he incurs in connexion with his appointment, then the county allowance can properly be omitted from his receipts.

ASTHMA.

DR. ALEX. M. BREMNER (Wood Green, N.) writes in reply to Dr. Thomas Martin (September 23rd, p. 582): "I would suggest that he try calcii acetyl sal., gr. x, three or four times a day. I have used it for the last ten months with benefit in asthmatic cases, in some cases with very marked success. In children I use calcii lactate with benefit. As calcium salts are used to prevent anaphylaxis in using vaccines and antitoxins it seemed to me that they would be useful in asthmatic cases, as they are in urticaria. I have tried parathyroid tablets but got no results from them of any value."

CHAULMOOGRA OIL IN TUBERCULOSIS.

MAJOR V. T. CARRUTHERS, F.R.C.S. (Derby), writes: Can any of your readers refer me to any account of the use of chaulmoogra oil or its derivatives in tuberculosis? The similarity of the bacilli of leprosy and tuberculosis would lead one to expect good results from treating tuberculosis with the remedy so useful in leprosy; and the experiment has doubtless been frequently tried.

LETTERS, NOTES, ETC.

PREVENTION OF BOTULISM.

DR. GEORGE WILLETT (Keynsham, Somerset) writes: I would like to ask whether it would not be possible to introduce into the sealed tin of preserved food a small quantity of some material such as oxygen, or some oxygen-producing substance, with the idea of preventing the growth of the anaerobic *Bacillus botulinus*. It seems to me that this could be quite easily accomplished and foods so treated thus rendered harmless.

RASH FOLLOWING HYPOPHOSPHATES.

"J. A. MacM." writes: Recently I saw a patient with slight swelling of the thyroid gland on the left side, apparently an adenomatous condition. I prescribed compound syrup of the hypophosphates (℥ss); after the first dose an urticarial rash, accompanied by intense itching, appeared; as she had been eating raspberries, I thought the rash was due to these and not to the medicine. However, I stopped it. The rash was followed by profuse desquamation. On August 7th she took another dose and again a similar urticarial rash with the itching appeared. I should be glad to know if hypophosphates are liable to do this. I have never seen a similar result before in twenty-five years' experience.

A SANITARY SEAT COVER.

A USEFUL and cleanly device, worthy of the attention of public health authorities and others, is the "White Star" sanitary seat cover, which is manufactured by Messrs. Vickers-Massey, Ltd., Sentinel House, Southampton Row, London, W.C. It consists of a wooden case with a hinged flap, containing sheets of thin paper which are drawn forward, as required, to cover the seat of a water-closet.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 30, 31, 34, 35, and 36 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 32 and 33.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *139*.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£ s. d.
Six lines and under	0 9 0
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Whole single column (three columns to page) ...	7 10 0
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Half page	10 0 0
Whole page	20 0 0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.